Working papers series

WP ECON 10.08

Unemployment Insurance and Job Turnover in Spain

Yolanda Rebollo Sanz (U. Pablo de Olavide)

JEL Classification numbers: J63, J64, J65

Keywords: Unemployment Insurance, Job Turnover, Multivariate Mix Proportional Hazard Models, Recall and Layoffs, Employment and Unemployment Duration

Department of Economics

Unemployment Insurance and Job Turnover in Spain

Yolanda Rebollo Sanz* (Universidad Pablo de Olavide)

Abstract

The aim of this paper is to shed some light on the potential relationships between the unemployment insurance system and labour market turnover, seeking to further the traditional view that this system has only behavioural consequences for the labour supply side of the labour market. This study assumes the incentives embedded in the unemployment insurance system have a heterogeneous impact, depending on the type of labour market transition (quits versus layoffs and recalls versus new job entrances) and on a worker's attachment to the labour market (gender and type of contract). The layoff hazard rate increases as workers qualify for unemployment benefits, while the quit hazard rate remains stable. Similarly, employment inflow increases sharply after the exhaustion of unemployment benefits. The timing and importance of the exit differs between recalls and new job entry and depends on a worker's attachment to the labour market. The results show that unemployment benefits appear to favour job turnover and both firms' and workers´ decisions seem to matter.

JEL Code: J63, J64, J65
Keywords: Unemployment Insurance, Job Turnover, Multivariate Mix Proportional Hazard Models, Recall and Layoffs, Employment and Unemployment Duration

The author would like to thank Jose Ignacio Garcia, Jan Van Ours and seminar participants at the Centro de Estudios Andaluces, FEDEA, ESPE-2009 and EEA-2010 for their helpful comments.

* Dpto de Economía, Métodos Cuantitativos e Historia Económica. Universidad Pablo de Olavide, Carretera de Utrera s/n, 41018 Sevilla (Spain) Phone: 954 977 978. Mail: yfrebsan@upo.es

1 Introduction

The labour market is in a constant state of flux. There is a continuous flow of workers into and out of employment, and from one job to another. Understanding job turnover is the key to understanding how the labour market operates. Turnover is necessary because it helps allocate workers to those jobs where they are most productive and allows employers to hire and fire according to economic conditions. It is not always optimal, however. Some groups of workers experience high layoff rates without ever advancing to better positions (Rebollo 2011; Gagliarducci, 2005). And some groups of firms face high firing rates without improving their productivity levels (Dolado and Stucchi, 2008; Bassanini *et al.* 2008).

One of the factors blamed for excessively high turnover in the labour market is the design of the Unemployment Insurance System, (UIS). Hence the aim of this paper is to shed some light on the potential relationships between the UIS and labour market turnover by seeking to further the traditional view that the UIS has only behavioural consequences for the labour supply side of the labour market. Accordingly, we analyse the Spanish labour market for the period 2000-2007.

Several features distinguish the Spanish labour market from other European labour markets. Firstly, it has a generous UIS financed by uniform payroll taxes. Uniform payroll taxes are frequently criticised for giving rise to too many layoffs, reducing the mean duration of employment and increasing unemployment (see Anderson and Meyer, 2000; Cahuc and Malherbet, 2004; Fath and Fuest, 2005; Blanchard and Tirole, 2008). Secondly, employment turnover is notably higher than in other European countries, with recent figures showing that nearly 50% of workers have held their current job for six months or less and almost 30% for no more than a year. Thirdly, more than 80% of newly signed contracts are temporary, and Spain's temporary employment rate has remained above 30% since the beginning of the nineties. Fourthly, more than a third of the unemployed who find a job return to their former employer.

The effects of UIS benefits on job turnover compound labour supply and demand forces and their relative importance continues to be an empirical issue. A number of empirical studies have already examined how certain characteristics of the UIS play out with respect to the duration and outcome of unemployment spells. Typically, these studies focus on the behavioural consequences of the UIS on the labour supply side of the labour market and their findings show that higher replacement ratios lead to longer unemployment spells and

that the probability of escaping unemployment increases as unemployment benefit entitlements are exhausted.

To understand whether demand or supply incentives are behind this effect, the researcher must take into account whether the unemployment spell finally ends in recalls or in a new job entrance and how the UIS affects the length of employment. In relation to the first point, the idea is that recall versus entry into a new job may involve several different causal mechanisms, all requiring explicit consideration in the analysis of the effect the UIS has on job turnover (Katz, 1986, Juradja, 2002). In relation to the second point, Juradja (2002) has shown that evaluating the UIS by studying only its effects on unemployment duration may lead to an underestimation of the total impact the UIS has on job turnover and hence on the unemployment rate. The influence of UIS eligibility parameters on employment duration, in contrast, has received scant attention and none of the empirical studies found takes into account the potential behavioural differences between layoffs and quits. These distinctions between different types of employment inflow and outflow are key to determining whether the UIS also affects a firm's hiring and firing decisions (as implicit contract theory shows, see Feldstein, 1976) and not only workers' decisions, as assumed in traditional analysis. For instance, one could easily argue that layoffs are triggered by productivity shocks while quits are triggered by reservation wage shocks (Blanchard and Tirole, 2008).

This paper conducts a more comprehensive analysis of the potential effects of the UIS on job turnover. Firstly, we take into account potential selection effects through the estimation of a multivariate mixed proportional hazard model –multiple spell and multiple states with competing risks- allowing for jointly-distributed unobserved heterogeneity. Although sample selection effects might be important in these types of analysis[1], few empirical papers take them into account. In particular, the analysis considers three distinct initial states: employment, involuntary unemployment, and voluntary unemployment. Secondly, we define a competing risk model for employment and unemployment spells as follows: within the state of employment, the analysis differentiates between quits (leading to voluntary unemployment) and layoffs (leading to involuntary unemployment). Within the involuntary unemployment state, we consider whether the spell ends in recall or the worker's entry into a new firm. Within the voluntary unemployment state we only consider exit to employment, as job quitters probably face zero recall expectations. Thirdly, given

[1] See Ham and LaLonde (1996) for a discussion of dynamic sample selection in multiple-state, multiple-spell data.

the strong duality of the Spanish labour market, we allow for heterogeneous effects of the UIS system between workers holding permanent contracts and those holding temporary ones. Finally, in order to take into account differences in labour supply decisions, the whole analysis is performed separately according to gender.

Although several dimensions of the UIS affect the labour market, we shall concentrate on two of its key components: Entry Requirement (ER) and Potential Benefit Duration (PBD). ER refers to the minimum number of weeks individuals have to work over a specified period in order to qualify for UIS benefits. PBD refers to the maximum number of weeks the unemployed worker is entitled to draw UIS benefits. In Spain, both parameters (ER and PBD) depend on the number of weeks worked over the six years prior to the onset of unemployment. The empirical method is to look for spikes in the employment and unemployment hazard profiles exploiting cross-sectional and longitudinal variations in ER and PBD parameters, respectively. As mentioned above, we allow these UIS parameters to differ between temporary and permanent contracts. Note that the influence of UIS benefits on search behaviour and reservation wage policy might differ depending on the type of contract.

Another key feature of this analysis is the use of an administrative dataset (Longitudinal Working Life Sample, LWLS) that allows compiling full employment histories and analysing the distribution of employment and unemployment durations as affected first by ER and then by PBD. It is very important to use an administrative dataset in this type of analysis since it avoids the existence of seam bias[2], a serious problem for estimating duration models, as it affects the timing of transitions.

Our results show that omitting the role of unobserved heterogeneity and dependence between the different states will hide the fact, among other things, there are certain types of workers whose labour market path is characterized by high exit probability from employment and long unemployment duration. The analysis presented also points to various behavioural consequences of the UIS on job turnover. Firstly, we observe that employment inflow and outflow is influenced by the UIS, varying the intensity of the effect by gender, type of contract and type of transition. In general, these effects stand out for those segments with a loose attachment to the labour market, such as women and temporary workers. Secondly, we show that employers might play a role in the timing of

[2] With seam bias, transitions or changes in status within reference periods are underreported, while too many transitions or changes are reported as occurring between reference periods. See Moore (2008) for a summary of seam bias research.

the layoff, as well as in the timing of the outflow from unemployment. Thus, the layoff hazard rate increases when the worker qualifies for UIS benefits; while job quit decisions remain unaffected. The exit rate from unemployment for benefit recipients records sharp increases around the time that benefits run out[3]. Interestingly, the recall hazard rate peaks one month prior to the exhaustion of benefits for workers previously hired on permanent contracts. Meanwhile, the new job hazard rate peaks when UIS benefits run out. In light of these findings, it can be concluded that the observed 'moral hazard' effects the UIS has on employment and unemployment duration cannot all be attributed to worker reactions alone. Note that the importance of these results resides in the finding that the UIS tends to reduce the time an individual spends in employment throughout their labour market career.

The rest of the paper is organized as follows. Section 2 describes the main characteristics of the Spanish UIS and Section 3 outlines the theoretical framework and reviews existing empirical literature. The data and econometric model are presented in Sections 4 and 5, respectively. The results of the empirical analysis are given in Section 6. The paper's conclusions are summarized in the final section.

2 Institutional Background

As in most OECD countries, there are two basic types of unemployment benefits in Spain[4]: Unemployment Insurance (UI) and Unemployment Assistance (UA). All employees who involuntarily become unemployed are entitled to UI benefits, provided that they have been employed for at least 12 months over the 72-month period prior to unemployment. Individuals receiving full-time disability benefits, voluntary job quitters and anyone over the age of 65 are excluded from UI benefits. Benefits end when individuals cease to be unemployed or complete the maximum benefit period. The amount of income provided for the unemployed is determined by multiplying the gross replacement rate by the average basic pay over the 12 months preceding unemployment. The monthly payment is 70% of average basic pay for the first four months of benefits and 60% from the fifth month onwards. Unemployment insurance is also subject to a floor of 75% of the statutory minimum wage (SMW) and a ceiling of between 170% and 220% of the SMW depending on a worker's family circumstances. The last two factors imply that the net replacement rate could be much higher than the gross rate quoted above. PBD and the amount of benefit received depend on previous employment duration and wage levels, respectively.

[3] This peaks are sharper than in other economies (see Grubb, 2011)
[4] For more details of the UIS in Spain see Bover, Arellano and Bentolila (2002).

These benefits last for a period of at least 4 months extendable in 2-monthly periods up to a maximum of 2 years, depending on the worker's employment record. UA benefits are available for those who have not been in work long enough to qualify for UI or who have exhausted their UI benefits.

Regarding the Spanish UIS, it is worth pointing out that it is financed by uniform payroll taxes. In particular, employers and employees both pay UI contributions. The government pays the balance outstanding. In the case of a permanent contract, the contribution rate is 7.55% (employees: 1.55%, employers: 6%). For fulltime fixed-term contracts, employees pay 1.6% and employers pay 6.7%. The employer's contribution increases to 7.7% for part-time work or if the employer is a temporary work agency.

During the sample period, two labour market reforms were introduced in Spain. They are relevant because these reforms involved new exogenous variations in the assignment between temporary and permanent contracts over the period studied here. The 2001 labour market reform[5] extended the prevailing programme of permanent employment promotion to any new cases. The decree also introduced limited compensation for the dismissal of workers on temporary contracts, amounting to eight days' pay per year worked. However, the most important change was the abolition of a firm's obligation to pay *interim* wages when dismissed workers appealed to employment tribunals, as long as the firm acknowledged the dismissal as being unfair and delivered the severance pay (45 days' wages per year of service) to the tribunal within two days of the dismissal. The 2006 reform introduced new restrictions on the use of temporary contracts. For instance, this reform limited the repeated renewal of employment contracts within the same company by obliging companies to offer a permanent contract to any worker who has had two or more fixed-term contracts and has worked in the same job for over two years within a period of 30 months. The permanent employment promotion policy also suffered important changes. It created incentives for companies to provide permanent employment contracts and establish fixed quotas (instead of the former percentage of contributions) for the target groups for these incentives, namely, women, young workers, disabled workers and persons on job training contracts. It provided a fixed yearly subsidy (with a maximum duration of three years) for temporary contracts converted into permanent contracts before

[5] We have estimated the model for the 2000-2002 period and ensuing years in order to evaluate whether these reforms could affect the results presented in the paper. Since we did not find any significant differences we have opted to omit them from the text.

31 December 2006, and allowed temporary contracts prior to 2008 to be converted into permanent ones.

3 UIS - Literature and discussion

The theoretical analysis of the potential effects of UI benefits on workers has traditionally focused on the exit rate from unemployment and has been based on job search models (Mortensen 1990). Within this framework, higher benefits drive up the reservation wage and decrease job search effort, thereby reducing the exit rate from unemployment and extending unemployment duration. The unemployment exit rate increases close to the time of benefit exhaustion as the value of being unemployed declines, so the marginal benefit from job-search increases and the reservation wage falls. A worker's search intensity can depend, among other factors, on the expected probability of recall. Job offers are related to wage and type of contract. In sum, the determinants of unemployment duration depend on the wage offered, the type of contract, unemployment benefits and recall expectations.

Although this disincentive effect of the UIS has been the conventional wisdom in modern labour economics, it might also depend on the type of unemployment; that is, whether it is due to a quit or a layoff, and if the latter is the case, whether the unemployment spell ends up in recall or in a new job entry. One could easily argue that layoffs are triggered by productivity shocks, while quits are triggered by reservation wage shocks[6] (Blanchard and Tirole, 2008). Similarly, while a worker's economic incentives embedded in the UIS are determinant in the search for a new job, firm incentives might play a significant role in the timing of recalls (Katz, 1986; Jensen and Nielsen, 1999; Roed and Nordberg, 2003). Katz (1986) suggests that the UIS financed by uniform payroll taxes may increase the impact of unemployment through temporary layoff by allowing firms to lay off workers who are less likely to be lost to other employers. More recently, Jurajda (2003) developed a dynamic model of layoff and recall decisions, showing that they both might depend on the amount of unemployment remaining to the worker. The main interest of his theoretical approach is that it explicitly links a firm's firing decisions to the probability of recall. The author assumes firms to be aware that unemployed workers with generous UI benefits will search less intensively than in an alternative scenario. In this scenario, he contends that in the

[6] It is true there might be incentives to harass (actions by firms to induce workers they would like to lay off to quit instead), shirk (actions by workers to induce firms they would like to quit to lay them off instead), or cooperatively misreport. For instance, by delaying a quit a worker with a positive probability of layoff will increase their chances of getting laid off and obtaining UI coverage. All these actions will depend very much in each case on the contribution rate. Blanchard and Tirole (2003) have informally explored these issues.

presence of demand fluctuations and firm-specific human capital, the optimal strategy for the firm will be to lay off workers with high benefit entitlements and recall those approaching the expiry of their benefits. All these arguments require a separate analysis for quits versus layoffs and recalls versus new job entry in a multi-state competing risk duration model where employment and unemployment outflows are explicitly considered.

Implicit contract models also offer a framework for understanding the potential effects UIS has on job turnover. These models describe the determinants of dismissals taking into account firm behaviour, based on the notion that the relationship between workers and firms is defined through "*implicit contracts*" (Feldstein, 1976, 1978; Bailey, 1977; Burdett and Wright, 1989), due to the economic uncertainty both parties face. In these models, both workers and firms see the advantage of including temporary dismissals as part of the contract because it enables them to delegate the cost of economic uncertainty to the UIS. Feldstein (1976) and Bailey (1977) support the idea that the greater the generosity of the UIS, the higher the unemployment rate due to temporary dismissals, while Burdett and Wright (1989), using a more general model, conclude the opposite; that is, a more generous UIS may reduce the unemployment rate. The main shortcoming of these models is that they assume the worker to be strongly attached to the firm, thus inaccurately describing the search behaviour of the unemployed worker. Nevertheless, one of the main interests of these models is that they have been used to consider the consequence of experience rating on temporary layoffs. Generally, the empirical analysis of experience rating provides support for Feldstein´s analysis (Topel, 1983; Anderson and Meyer, 1993, 2000; Cahuc and Malherbet, 2004; Fath and Fuest, 2005; Blanchard and Tirole, 2008)[7].

New theoretical work has recently shown that the entitlement effects of the UIS might also differ according to the nature of the job and the degree of a worker´s attachment to the labour market. For instance, Boone and Van Ours (2009) present a theoretical model to explain the spike in the unemployment hazard rate upon UI benefit exhaustion in which one must take into account the type of contract. They propose a model where firm and workers are matched and then decide on the wage and the starting date of the job. They show that a delay in the starting date requested by the worker and linked to their potential

[7] The research by Anderson and Meyer (2000) is of particular interest since the authors provide a detailed analysis of the 1984 Washington state legislation switch from a payroll tax system to an experience-rated system. Blanchard and Tirole (2008) suggest that at least a partial shift from payroll to layoff taxes, accompanied by limits on judicial intervention, would lead to a better allocation. Once forced to internalize the costs of unemployment insurance, firms are in a much better position than the tribunals to assess whether layoffs are economically justified. Cahuc and Malherbet (2004) show that the inclusion of experience rating increases employment and the welfare of low-skilled workers. Fath and Fuest (2005) find that experience rating reduces labour turnover and increases employment.

unemployment UI benefit duration generates a spike in the outflow rate. They argue that since permanent jobs are more stable, a firm´s propensity to accept the delay proposed by the worker holding a permanent contract will be higher than for a temporary job. Hence, spikes upon benefit expiration should be larger when the new worker is hired under a permanent contract than under a temporary one.

Note that when using Jurajda's approach, one could also offer an alternative way of arguing that the timing of the recall could differ between permanent and temporary workers. Firstly, firm-specific human capital –the main argument behind the recall policy of firms in Jurajda's model-, should be more relevant for a permanent worker. Secondly, if one assumes that the arrival rate of temporary contract job offers is larger than for permanent ones[8], the influence of UI benefits on the individual reservation wage may be less negative if the job offered is permanent rather than temporary. The idea is that a worker's acceptance probability is higher for a permanent job offer given the likely greater utility attached to the increased job stability of a permanent contract than for a temporary one. Within this framework, it can be extremely expedient for the firm to recall a previously permanent worker before the exhaustion of UI benefits. This distinction might also be relevant for explaining differences in the timing of the recalls. The idea is that as firms know that an unemployed worker who previously held a permanent contract faces a larger probability of receiving a job offer associated to a permanent contract, they will not wait until the exhaustion of UI benefits to recall the worker.

The empirical literature describing the effects of UIS on unemployment and employment duration controlling for selection effects is rather limited due to the scarcity of large micro datasets with information on labour market histories and unemployment benefits. Typically, the analysis has focused on studying the effects of the UIS on unemployment duration and to a lesser extent on job duration. Common findings are that the unemployment hazard rate increases as benefits run out[9]. For instance, Roed and Nordberg (2003) use Norwegian data to show that the recall hazard rate increases by a factor of 3.5 when UI benefits are fully exhausted, compared to a situation with at least 7 months left of these allowances. Meyer (1990) finds that the unemployment exit rate is double the exit rate one month before benefit expiration[10]. Katz and Meyer (1990) find that job finding rates in the

[8] Bover and Gómez (2004) find that exit rates to temporary jobs in Spain are ten times higher than exit rates to permanent jobs, although this difference decreases with unemployment duration.
[9] See Caliendo *et al.* (2009) for a recent summary of the main results in this respect.
[10] He analyses administrative unemployment insurance records from the Continuous Wage and Benefit History database.

exhaustion week are 2.2-2.3 times the usual job finding rate, both for recalls and new jobs[11]. Boone and Van Ours (2009) report that the job finding rate concerning permanent jobs in a month of benefit expiration, is about three times as high for males and 3.7 times as high for females as in the same month without benefit exhaustion. For the case of transitions to temporary contracts, they find spikes that are about 50% (males) and 75% (females) higher than regular job finding rates. For the Spanish economy, Alba-Ramirez *et al.* (2007) investigate the exits from unemployment of benefit recipients and report that recall and new job hazard rates increase around the time benefits run out.

Little empirical research, in contrast, has focused on the direct impact UIS has on the timing of layoff decisions. Christofides and McKenna (1996), Green and Ridell (1997), Baker and Rea (1998) and Green and Sargent, (1998) used employment hazards to study Canadian UIS incentives in job spell duration. They all find that variations in entry requirements in the UIS have a significant impact on employment durations. In particular, Baker and Rea (1998) find a significant increase in the employment hazard rate (varying from 1.4 times to almost double, depending on the model estimation) in the week the worker qualifies for UI benefits[12].

Only Jurajda (2002) offers a joint estimation of the effects UIS has on both unemployment inflow and outflow using a dataset of labour market histories of displaced US workers. He finds that although entitlement to UI benefits significantly increases the layoff hazard, the quit hazard is not affected by any UIS parameters.

These papers indicate that the effects of UI benefits on employment and unemployment duration are important and might compound labour supply and demand forces. This paper extends the existing literature by analysing the effect UI has on labour market transitions considering quits versus layoffs as the reason for entry into unemployment and recall versus new job acceptance as the means of exit from unemployment. Moreover, it takes into account a major singularity of the Spanish labour market, i.e., strong segmentation due to the existence of temporary and permanent contracts.

[11] They use the same data as Meyer (2003), albeit supplemented with telephone interviews.

[12] One branch of the empirical literature dealing with UIS effects on layoff behaviour has been motivated by imperfect experience rating and has tended to use cross-sectional data. However, longitudinal data offer a better framework for the analysis of this effect since UI benefit entitlement, which may also affect the decision to lay off workers, varies over the duration of the period of employment.

4 Data and descriptive statistics

The analysis is based on individual data from the Social Security records called the Longitudinal Working Lives Sample[13]. The LWLS, which is compiled annually, consists of a sample of over one million worker case-histories. The initial sample includes all individuals who came into contact with the Social Security system at least once between 2005 and 2008[14]. This database provides highly detailed information about their past and present labour activities, including monthly wage, type of contract, receipt of UI benefits, and reasons for job termination, as well as several characteristics of the hiring firms, such as size, age, ownership, location and sector of activity. Individual characteristics such as age, gender and nationality are also present in the database.

There are several characteristics that make the LWLS relevant to this study. Firstly, it is an administrative dataset that provides highly accurate information on employment and unemployment transitions; the data not only consider the period when workers are covered by unemployment benefits but also the period of transition from unemployment to employment after benefits run out. Notice that a main disadvantage of other administrative datasets used in this type of analysis is that unemployment is truncated at the point benefits run out. Thus, Card *et al.* (2007) posit that the incidence of potential benefit duration on the unemployment exit rate is conditional on the way the researcher measures the end-of-benefit spike phenomenon[15].

Secondly, the possibility of viewing each worker's entire labour market history allows identifying the point at which an employee qualifies for UI benefits and hence computing their potential benefit duration when unemployed. The resulting multiple-period, event history dataset is unusually rich in terms of the variation of entitlement and unemployment benefit levels. Thirdly, the database assigns each job spell an employer identification code, thus enabling the detection of recalls versus new job entrances. Fourthly, since the reasons for the separation are known, it is possible to distinguish layoffs from quits.

We track each employment/unemployment spell to the point of transition or to the end of the observation period. For sake of simplicity in the case of a transition to another job with

[13] For a detailed description of this sample, see Duran, (2007) and García-Perez (2008).

[14] Currently, the social security system offers five samples for the years between 2004 and 2008. For the purposes of this paper, the four most recent databases were merged (LWLS, 2005-2008) and LWLS-2004 was omitted, as the information it offers barely differs from that available for subsequent years.

[15] In particular, they point out that this effect is notably lower when measuring the incidence of UIS on employment entrance than when measuring the incidence on unemployment outflow, and the unemployment spell is censored upon the exhaustion of UI benefits.

no intervening spell of unemployment[16], the employment spell is treated as censored. Each uncensored job spell is identified either as a layoff or a quit[17] using the reasons for ending the contract provided by the firm. Following the competing alternatives defined for the employment spell, we sort the pool of unemployed into involuntary unemployment (due to a layoff) and voluntary unemployment (due to a quit). All unemployment spells lasting beyond the end of 2007, which is the last recorded observation, are treated as right censored. Here, we are only interested in job finding rates. Hence, a terminated spell of unemployment is identified as a recall or entrance into a new firm using the firm code provided by the dataset.

We measure the duration of each contract in months based on the specified start and end dates. Likewise, we compute the duration of each spell of unemployment by measuring the time lapse between the end date of a worker's previous contract and the start date of the new one. To avoid odd behaviour in the estimated baseline hazard functions due to the sparsity of observations for longer durations, we right-censored any observed spells of unemployment longer than or equal to 24 months[18] and any observed spell of employment longer than or equal to 60 months.

We compile individual UI claim histories from full individual labour market histories. We identify the exact month of employment in which the individual qualifies for UI benefits by combining the data on duration of employment and on duration of previous unemployment with these benefits according to the rules laid out in the Spanish UIS. These state that UI benefits recommence at the end of any preceding benefit claim as long as they have been exhausted. The database includes the date of the last UI benefit claim, thus enabling us to determine the number of weeks of insured employment already accumulated at the start of an employment spell. PBD - the maximum number of months the employee is entitled to UI benefits when unemployed - is computed analogously. In both cases, we allow for benefits ending when a new job is found. It is important to stress that the administrative source and the comprehensive nature of the dataset reduce measurement errors to a negligible level.

The final data used here includes a sample of spells of employment (not including self-employment) and unemployment for Spanish workers aged between 18 and 55 over the

[16] A job-to-job transition is considered here to involve those cases with an observed unemployment spell of 15 days or less.
[17] Transitions from employment to inactivity are omitted.
[18] Notice that transitions from unemployment to inactivity are not identified in the sample.

period 2000-2007[19]. Table 1 provides a descriptive overview of the events recorded by gender, with the sample split into three groups by labour market status: employment, involuntary unemployment (due to a layoff) and voluntary unemployment (due to a quit). A key point to note is that the majority of the uncensored employment spells are layoffs: 75% for male workers and 80% for females. Between 34% (males) and 44% (females) of involuntary unemployment spells end in recall. Hence, the data reveal that the probability of layoff and the probability of recall are both important and greater for female workers than for their male counterparts. It is also worth noting that the mean duration of unemployment is shorter for laid-off workers returning to the same firm than it is for the rest. For instance, the average duration of unemployment is 3.4 months for female workers who are temporarily laid off and 5.3 months for those who move to a different firm. This might be the first evidence that the behavioural impact of UI on time spent unemployed might differ with the type of transition, as firms' hiring decisions also matter, especially in the case of recall transitions.

Finally, the percentage of job quitters eventually re-entering employment is higher than that of laid off workers. Although not shown in the Table, it is also interesting to note that only around 5% of these transitions involve a return to the previous firm. This observation is important, since it highlights the uniqueness of this part of the unemployment sample and its need for special treatment in the econometric model.

Although not shown either, it is important to note that on average workers experience three employment spells and four unemployment spells within the sample timeframe. These individuals record a large degree of job mobility, with below average durations of both unemployment and employment spells. The existence of this group of workers suggests the possibility of substantial unobserved heterogeneity correlated across spells and states affecting the selection into multiple spells. Such sample selection may induce some correlation of the unobserved heterogeneity component with the UIS variables because eligibility rules make UIS variables depend on workers' labour market histories. This issue will be considered in the econometric analysis.

4.1 Main Descriptive Statistics: some stylized facts

Figure 1 plots the outflow from employment, taking into account the competing risks described previously, as a function of elapsed employment duration. The trend differences

[19] The analysis is restricted to this period because it coincides with a period of major economic growth in Spain.

between layoffs versus quits are very clear; hence the need to estimate them separately. The layoff profile shows spikes at certain contract durations[20] (3, 6, 9 and 12 months), with the sharpest at month 12.

In order to provide some insight into UI qualifying effects on job exit rates, Figure 2 depicts the layoff and quit outflow rates taking into account individual heterogeneity in the UI benefit-qualifying periods. Note that people enter employment spells with different labour histories and have therefore accumulated different numbers of weeks of insured unemployment from past spells. Employment layoff and quit outflows are depicted for two different cases: the first for workers having started the current contract with zero months' entitlement to UI benefits (i.e., having previously exhausted earned benefits); the second, for workers starting the current job spell with a positive number of months' entitlement to benefits (i.e., after a job-to-job transition). By comparing these two cases it is possible to ascertain whether the timing of the layoff is related to the date of entitlement to UI benefits. These figures show that although the date of entitlement to UI benefits might influence the timing of layoffs, the timing of quits appears to be independent of this influence. The spikes in exit through layoff at month 12 are much sharper for the first of the above groups than for the second, but no such difference is observed at months 3 and 6. Moreover, the rate of voluntary exit from employment is similar for both groups.

Turning our attention to the sample of unemployed workers, we now present the plots of outflow from unemployment as a function of elapsed duration of unemployment for the subsamples of workers who received UI benefits and for workers who did not (Figure 3), taking into account recall versus new job entry transitions. Some points are worth noting. Firstly, the outflow rate from unemployment decreases more steeply over the unemployment spell for non-receivers. Hence, as shown in the literature, workers who have received UI benefits face longer periods of unemployment than other workers. Secondly, the hazard rate from unemployment varies according to whether or not the spell ends in recall, which calls for a different specification for each type of transition. Observation of benefit receivers shows that the exit rate from unemployment is steeper for new job entrances than for recalls. This difference might be linked to lower job search intensity in workers expecting to be rehired.

To show that the UIS might also affect the timing of the exit from unemployment and that the effect varies with the type of transition, we compute the outflow from unemployment for

[20] Previous empirical evidence has already shown that these peaks mainly involve temporary contract durations (see Rebollo 2011).

UI receipts with two PBDs: four and six months (Figure 4). If PBD does not affect the timing of exit from unemployment, then there should be no significant differences between recalls and new job exit rates. Two main conclusions can be drawn from Figure 4; i) the involuntary unemployment hazard rate increases around the time of benefit exhaustion; ii) there is a different slope between recalls and new job entrances. Specifically, for recalls the unemployment hazard rate increases just prior to UI benefit exhaustion, whereas for new job entrances this increase takes place after benefit exhaustion.

5 The Econometric Model

To analyze the effects of the UIS on employment and unemployment duration, we estimate a multivariate mixed proportional hazard rate model (MMPH) using the timing-of-events approach formalized by Abbring and Van den Berg (2003). Our MMPH model considers five events (i) employment spells ending through layoff; (ii) employment spells ending through a quit; (iii) involuntary unemployment spells ending in recall; (iv) involuntary unemployment spells ending in entry into a different firm; and (v) voluntary unemployment (or quit) spells ending in recall or entry into a different firm[21].

Assuming, for reasons of tractability and interpretation, that the hazard rates are proportional, and given the characteristics of the dataset, this paper uses discrete time duration models in which the proportional hazard assumption implies that each hazard $h^s_k(j)$ {s=initial state; k=destination state; j=duration} takes the complementary log-log form (Jenkins, 2005). Thus, the general specification of the hazard rate to be estimated is as follows:

$$h_k^s\left(j / z_k, x_k, d_k, \upsilon_k\right) = 1 - \exp\left(-\exp\left(z(j)\rho_k^s + x(j)\beta_k^s + d(j)\delta_k^s + \upsilon_k^s\right)\lambda_k^s(j)\right) \qquad (2)$$

We define five sets of explanatory variables. The first contains the individual economic incentives embedded in the UIS {*z(j)*}; that is, PBD for involuntarily unemployed workers and ER for employed ones. In both cases, we measure the effect of these parameters distinguishing by type of contract. We also include the wage -in the previous job for the case of unemployment spells- as a proxy of the UI benefit level. Note that these economic incentives are omitted in the estimation of the quit hazard rates[22]. The second consists of a set of observed individual and job control variables {*x(j)*} such as age, nationality, total

[21] Due to small sample issues, for voluntary unemployment spells we make no distinction between recall and entry into a different firm. In fact, less than 6% of voluntary unemployment spells end in recall.
[22] Given the rules governing the UIS in Spain, job quitters cannot received UI benefits.

labour market experience, part-time job, hired by a temporary work agency, type of contract, sector of activity, firm size, job qualification, firm ownership structure, etc. The third set contains observed aggregate variables, {*d(j)*}, to control for aggregate and regional demand side effects, such as the quarterly regional unemployment rate and the quarterly growth rate of production. In the fourth, the term {$\lambda(j)$} stands for the integrated baseline hazard. The fifth covers unobserved individual characteristics {$\upsilon^{s}_{k,}$}, assumed to be specific to the origin and destination states[23].

The consideration of the unobserved heterogeneity term is especially relevant within this framework. Firstly, we have multiple spells raising the possibility of selection biases, since the workers who have multiple unemployment and/or employment spells may be a non-random sample. Secondly, the level and availability of UI benefits depends on workers' employment histories. To the extent that employment histories could be driven by unobservables, this may introduce dependence between UI benefits and unobservable heterogeneity, biasing the estimation of the UIS effects on employment and unemployment hazard rates.

Apart from the assumption of proportionality, the specification of each hazard rate is highly flexible. Changes in each baseline hazard are captured by a polynomial in the log of the corresponding duration. The UIS parameters are modelled as dummy variables and many of the remaining individual and job variables are dummy-coded to overcome arbitrary functional form restrictions.

Several characteristics of the database and model specification have proven to be relevant for separately identifying the transition pattern arising from unobserved heterogeneity, the form of true duration dependence and the causal effects of the UIS on spell duration. Mainly, they are a random variation in the observed moment of spell transition[24] (Abbring and Van den Berg, 2003), multiple spells[25] (Gaure *et al.*, 2007), lagged variation in exit rates[26] (Van den Berg and Van Ours, 1994,1996), and variation in lagged explanatory

[23] Hougaard (1998) stresses that it is too restrictive to assume equality between the unobserved heterogeneity components for different states.
[24] For instance, the existence of time variation at the onset of each spell ensures that people with exactly the same spell lengths have been exposed to different macroeconomic conditions earlier in the spell, and hence to different selection forces.
[25] A comparison between the total number of spells and the number of individuals reveals that multiple spells have a non-trivial impact within the sample.
[26] The basic idea is that the conditional expectation on unobserved heterogeneity (conditional on observed individual and job characteristics, spell duration and aggregate variables) depends on the exit rate affecting the earlier part of the spell, while true duration dependence does not; the higher the past exit rates, the higher the selection in any given spell duration and the lower the expected value of the unobserved covariate.

variables[27] (Brinch, 2000). Hence the mixed proportional hazards assumption is not crucial to this analysis.

The identification of the effects of UIS parameters on spell duration does not rely exclusively on cross-sectional variation but also on longitudinal variation. An important source of identification of the effect of the ER parameter on employment transitions is its dependence on total employment rather than on time in current job. In other words, people enter employment spells with different labour histories, and thus have accumulated different numbers of weeks of insured unemployment from past employment spells. Similarly, we identify the UI benefit exhaustion parameter according to the perspective that the PBD varies among workers with different accumulated amounts of job tenure. We can therefore compare the probability of exit from unemployment for two workers who have both received benefits but have different PBDs.

To estimate this discrete-time duration model, we construct a panel dataset such that the spell length of any given individual determines a vector of binary responses. Let y_{ik} be a binary indicator variable denoting transitions to potential destination states upon exit, i.e., y_{ik}=1 if individual *i* transits to state *k* and zero otherwise, and let Y_i be the complete set of outcome indicators available for individual *i* (multiple-spells). The contribution to the likelihood function formed by the event pattern of a particular individual, conditional on the vector of unobserved variables v_i=(v_1,v_2, v_3, v_4, v_5), can then be formulated as:

$$L_i(\upsilon_i) = \prod_{y_{isk} \in Y_i} \left[\prod_{s=1}^{S} \prod_{j=1}^{J} \prod_{k_s=1}^{K_s} \left(h_{jk_s}^s \right)^{\delta_{jk_s}^s} \left(1 - h_{jk_s}^s \right)^{1-\delta_{jk_s}^s} \right] \quad (3)$$

where $\delta_{jk_s}^s$ takes the value one if the individual transits from state *s* to state *k* during period *j* and zero otherwise. We introduce unobserved heterogeneity non-parametrically by means of the non-parametric maximum likelihood estimator (NMPLE). In practice, this implies that the vectors of the unobserved attributes specific to each type of transition are jointly discretely distributed. The number of mass-points is determined by adding location vectors until it is no longer possible to increase the likelihood function (Heckman and Singer, 1984; Gaure *et al.*, 2007). Assuming that the unobserved covariates are jointly discretely distributed with Q number of support points, the data likelihood function can be written as:

[27] Brinch (2000) proves that variation in covariates over time combined with covariates across individuals is sufficient for non-parametric identification of structural duration dependence and unobserved heterogeneity without the assumption of proportional hazards.

$$L = \prod_{i=1}^{N} \left[\sum_{l=1}^{L} q_l L_i(\upsilon_l) \right], \quad \text{with} \quad \sum_{l=1}^{L} q_l = 1 \tag{4}$$

where $\{v_l, q_l\}$, l=1….L, are the location vectors and probabilities characterising the heterogeneity distribution. The mass points (or combinations of mass points) and their associated probabilities are estimated together with the model's other parameters. Since each hazard rate contains a constant term, for identification purposes the unobserved heterogeneity is modelled by normalizing the first 5-tuple of location parameters to zero so that the estimated coefficient for the remaining unobserved types of individuals denotes the deviation from the constant term. For the estimation procedure, the probabilities q_l are specified as logistic[28] probabilities[29].

6 Estimation and Results

The estimated model contains a large number of parameters, most of which are included solely for control purposes and are secondary to the topics discussed in this paper. Table 2 summarizes the descriptive statistics of the variables considered in the estimation. Hence, although the full results are reported in Table A1 (Appendix), they are not all discussed in the text. The focus in this section is on key results regarding the impact of the UIS on employment and unemployment duration. The results are presented in terms of individual parameter estimates (relative hazard rates) and some post-estimation exercises. Unless otherwise specified, all the estimated exit probabilities are evaluated at the mean of the regressors.

Overall, the estimation of a MMPH model for employment, and involuntary unemployment transitions that explicitly considers layoff versus quit transitions, voluntary and involuntary unemployment transitions and recall versus new job entry, respectively, shows its relevance in the significant differences between the patterns of duration dependence and the effects of the explanatory variables on each hazard rate. For the same reasons, the separate estimation of voluntary and involuntary unemployment spells is also relevant.

The likelihood function for the MMPH model obtained their maxima at three mass-points in the distribution of unobserved heterogeneity. These support points were robustly identified on the basis of a large number of estimators with different starting values. The results are

[28] This means that probabilities can be reduced but never set exactly to zero.
[29] Standard errors for all the probabilities are obtained using the delta method.

also highly robust as long as the number of support points lies between 2 and 3[30]. This may imply that the information content in the data relating to the distribution of the unobserved heterogeneity term is sufficient to ensure robust identification of the structural duration dependence in the hazard rates, as well as the effects of the UIS on spell duration.

6.1 Duration dependence and selection effects

The duration model is estimated using a polynomial baseline[31]. In particular, for each hazard, we use the highest level of the polynomial in the log duration the data require. For the layoff hazard rate we additionally use five dummy variables to control for the spikes observed at certain contract durations (months 3, 6, 12 and 24). These spikes were not empirically relevant for the rest of hazard rates, nor statistically significant.

The pattern of the predicted hazards is shown in Figures 5-8. Each predicted hazard is depicted considering the three "types" of workers identified from the unobserved heterogeneity term in order to reveal the large differences encountered. The estimated layoff hazard rate (Figure 5) shows positive duration dependence during the first year of the contract, and subsequently turns negative. It also shows spikes at specific contract durations, the largest at months 6 and 12. The estimated quit hazard rate –not shown- is low and remains fairly constant throughout the spell. The estimated recall hazard rate (Figure 6) shows negative duration dependence, as documented by previous researchers. In contrast to previous research, we find that the new job hazard rate (Figure 7) also shows negative duration dependence, albeit of a lesser magnitude than the one found for the new job hazard rate. It is also interesting to note that the estimated recall and new job hazard rates are very close at the beginning of the unemployment spell, but start to diverge at around the fourth month. The estimated voluntary unemployment hazard rate (Figure 8) shows strong negative duration dependence, as expected.

[30] We have also tried to estimate the model with four points of support, but there was no convergence in any of the estimations.

[31] We also estimated the model free of parametric restrictions on the effects of spell length, since duration dependence was defined as a monthly step function. But the parameters of interest were not sensitive to the way the duration dependence was modelled. In fact, Eberwein, Ham and LaLonde (2002) find that estimates of the expected duration in a state are insensitive to the way one models duration dependence if long spells are observed in the data. They observe that when estimating the parameters of the hazard function, it is important to choose a flexible specification of duration dependence, but it does not matter which flexible form one chooses for the baseline hazard. We have opted to present the model using the polynomial baseline because it implies a fewer number of parameters.

As one can see from these figures, unobserved heterogeneity is responsible for a substantial degree of variation in all the estimated hazard rates. Moreover, the estimation controlling for unobserved heterogeneity and dependence between different labour market states conceals some interesting results which would remain unknown when estimating the model separately for each labour market state. In Table 3 we display the average estimated hazard rates for each "worker type". This Table shows us the relationship between the unobserved characteristics affecting each type of spell. In general, unobserved selection effects indicate there are workers who tend to have low employment stability and long episodes of unemployment. For instance, there are some male workers who face the largest exit employment probability and the lowest exit unemployment probability (i.e., male worker type III representing around 22%). Interestingly, for female workers this relationship is different. Female worker type III -representing around 24% of female workers- have the lowest employment stability but face a probability of being recalled after the unemployment spell higher than female workers type I –representing around 47%. Interestingly, the recall hazard rate for this group of workers is higher than the new job hazard rate at the beginning of the unemployment spell.

We also obtain the sign of the relationship between competing risks within each labour market state once selection effects between different labour states are controlled. For instance, layoffs and quits seem to be positively correlated through the unobserved heterogeneity term. The correlation between recall and new job hazard due to unobservable factors seem to be also positive.

6.2 UIS incidence on employment duration

The empirical analysis presented in this section is based on the notion that the UIS might affect the timing of involuntary exit from employment. Using on-the-job search models, one can argue that in the presence of demand fluctuations and firm-specific human capital it will be expedient for a firm to layoff those workers who are entitled to UI benefits and recall them as the benefits approach exhaustion (Juradja, 2003). One could also claim that people with loose attachment to the labour market will be the most affected by UIS entry requirements (Baker and Rea, 1998). This latter idea supports the need to estimate the incidence of the UIS taking into account the type of contract held by the worker. Our basic distinction is between temporary and permanent contracts.

We capture the effects of qualification for these benefits with a set of time-varying explanatory variables for different levels of entitlement. The first dummy variable, *entitlement,* takes value one at the month the qualifying period is fulfilled and zero otherwise. This latter variable picks up any peak in the employment hazard rate in the first month of UI benefit entitlement. We then allow for the effects of the length of the available entitlement, conditional on the worker being eligible, by adding a step function to the length of entitlement, grouped as follows: *between 1-4 months*, *between 5-8 months*, and *between 9-12 months*, after the qualifying period has been fulfilled. This last set of dummy variables could be relevant because potential benefit duration when unemployed increases as the worker accumulates months of employment.

As can be seen from Table A1 (Appendix), the set of variables describing the entitlement effect tends to be statistically significant for both contract types. One useful way of illustrating the impact of the entry requirement on layoff and quit hazard rates is to plot them against the benefit qualifying period. This information is depicted in Figure 9. The figure shows that the impact of the UIS on employment duration varies with the degree of attachment to the labour market, as it is stronger for female workers and those holding temporary contracts than for male workers holding permanent contracts. To complement the above-mentioned figures, we display in Table 4 the variation in percentage points of the estimated employment hazard rate around the time of benefit entitlement relative to the previous month. The layoff rate records a spike at the point where the worker qualifies for benefits, whereas the quit hazard rate hardly varies at any point with this parameter. The sharpest spikes are found for female workers: when holding a temporary contract their layoff hazard increases by 0.62 percentage points when qualifying for benefits and falls by 2.33 percentage points afterwards –both cases, compared to the previous month; when holding a permanent contract, the variations in these exit rates are 0.60 and -0.49, respectively. For the case of male workers with temporary contracts, the variations in these exit rates are 0.18 and -0.95, respectively.

In order to illustrate how the monthly transition probability pattern varies depending on the timing of a worker's qualification for UI benefits, Figure 10 combines the estimated effects of the UIS and spell duration. We depict the layoff hazard rates associated with eligibility taking place at two different months during the current contract: 6^{th} (case 1, i.e., the worker has already accumulated six months of employment prior to the current spell) and 12^{th} (case 2). To illustrate the significance of the effects, let us focus on female workers. Figure

9 shows that a female permanent worker who qualifies for UI benefits at the 6th month –case 1- faces a layoff hazard rate of 1.78% at that moment, while one month afterwards this rate drops to 0.47%. On the other hand, at the 6th month, if the worker does not qualify for UI benefits –case 2- the layoff hazard rates are 0.59% (at the 6th month) and 0.35% (one month later). The estimated layoff hazard rate for a female temporary worker at the 6th month is 13.26% and drops to 5.48% one month afterwards for case 1 and is 12.19% and drops to 7.35% one month afterwards for case 2. Finally, notice that the spike in the layoff hazard rate at month 12th is notably higher for workers becoming eligible to receive UI benefits at that month –case 2- than for workers already eligible for these benefits –case 1.

The results presented so far reveal a significant effect of UI benefits on layoffs that is not found for quits, suggesting that employers could be involved in the timing of layoffs. It should be remembered that Spanish firms face no experience rating of any kind. In these circumstances, firms and workers may jointly time layoffs to "play" the UIS. Alternatively, one could argue that from a firm's perspective it may become less costly to fire a worker entitled to UI benefits, as such a worker may have less incentive to contest their dismissal than one who faces having no income while unemployed. The worker can, for instance, agree to refrain from taking legal action to fight the dismissal in exchange for not being laid off before the entitlement period. One could also argue that firms may class worker departures as "layoffs" to avoid the label of uncooperative employer or to reduce other job severance costs. In all cases, the estimated effect of the qualifying period on the timing of the layoff appears to reflect moral hazard problems on both sides of the market.

The incidence of the UIS on employment duration seems to be greater for temporary workers than for permanent ones. From a firm's perspective, different ideas can support this result. Firstly, the lower dismissal costs associated to temporary contracts may explain this large difference. In addition, the differences in individual productivity associated, for instance, to different levels of specific human capital can also explain the observed difference.

6.3 PBD incidence on unemployment duration

The specification of the involuntary unemployment hazard[32] rate includes a step function to control for the number of months of UI benefits remaining, being grouped as follows: *more than 4 months, 2 to 3 months, 1 month, 0 months (*called the *exhaustion effect).* We use the first set of time dummies to model the effect of receiving UI benefits that depends on the months remaining before exhaustion. One could claim that a worker´s search effort will increase as the month of benefit exhaustion draws closer. From a firm's perspective, assuming as given this behaviour by the worker, the probability of re-hiring the worker will also increase as the month of exhaustion of benefits approaches, with this effect being tougher for workers with a strong attachment to the labour market. We use another step function to control for the months following benefit exhaustion, being grouped as: *1 month, 2 to 3 months, more than 4 months*[33]. We use this second set of time dummies to model the incidence of having received UI benefits. In this way, we can capture the behaviour of UI benefit receivers over the entire unemployment spell. All these UI variables interact with the type of contract held in the previous job. In general terms, all these variables are statistically significant (see Table A1), which suggests that unemployment benefits affect the timing of the outflow from unemployment. They show that, on average, the current receipt of benefits causes a reduction of more than 60% in the transition rate out of unemployment.

The common finding that the unemployment hazard rate rises as benefit exhaustion approaches (Meyer, 1990; Meyer and Anderson, 1990; Roed and Zhang, 2003) is also obtained in this estimation. The results show that the exhaustion effect is important, irrespective of gender, type of contract or type of transition. This result immediately suggests that the net effect of the UIS on unemployment and employment duration depends crucially on the length of the treatment period; that is, PBD.

It should be noted, however, that the estimated model allows us to go further, as it shows that the impact of the UIS on the probability of exit from unemployment differs according to whether or not the worker returns to the previous firm, as well as differing by contract type. To illustrate the different patterns obtained, Figure 11 shows the recall and new job hazard

[32] This section focuses on the results for the involuntary unemployment hazard rate. The inclusion of the voluntary hazard rate in this estimation is justified to control for selection effects, and none of the benefit variables are included in this hazard.

[33] We compute these sets of dummies by first calculating PBD for each individual and then, for each unemployment spell duration, the number of months remaining before UI benefit exhaustion and the number of months following benefit exhaustion.

rates in relation to the time remaining before the exhaustion of benefits and the time following their exhaustion. To complement the abovementioned figures, Table 5 shows the variation in percentage points of the estimated hazard rate around the time of exhaustion relative to the previous month. Basically, our results show that the behavioural impacts of UI benefits are not the same for recall and new job entry and depend on the degree of attachment to the labour market.

The incidence of the UIS on unemployment outflow seems to be stronger for workers with loose attachment to the labour market, as with employment spells. Again, these effects are larger for female and temporary workers than for male workers holding a permanent contract.

One interesting difference worth noting involves looking at the timing of the effect of the UIS on the unemployment exit probability by type of contract and type of transition. The recall hazard rate for workers who previously held a permanent contract records the largest spike just one month prior to benefit exhaustion. For instance, the recall hazard rate increases by 2.96 and 2.99 percentage points for female and male permanent workers, respectively, just one month before exhaustion –compared to the hazard rate two months prior to expiration-, while at the month the benefits run out the recall hazard rates hardly varies. Note the importance of this effect, as the recall hazard rate increases more than fourfold (from 0.94% one month before benefit expiration to 3.93% at benefit expiration) in the case of males and more than fivefold in the case of females (from 0.58% one month before benefit to 3.54% at benefit expiration). The new job hazard rate for permanent workers also starts increasing one month prior to UI benefit exhaustion, but it peaks when benefits are exhausted or one month later. For instance, one month prior to exhaustion the new job hazard rate increases by 4.56 and 2.89 percentage points, for male and female permanent workers, respectively, while at the time of UI benefits exhaustion this variation increases to 24.15 and 6.80 percentage points for the same worker groups.

All the same, as stated above, the largest spikes are obtained for temporary workers, and they are recorded when UI benefits run out. For these workers, the recall hazard rate increases by 6.66 (from 6.19% to 12.85%) and 5.02 percentage points (from 4.64% to 9.66%) for male and female workers, respectively, while the new job hazard rate increases by 11.39 (from 15.20% to 26.59%) and 6.40 percentage points (from 9.73% to 16.13%) for

the same worker groups. Note that since the hazard rates for temporary workers are the highest ones, these last effects are also the most relevant from an economic point of view.

Figure 12 combines the estimated effects of benefit exhaustion and unemployment spell duration. We display each hazard rate in relation to unemployment duration for a worker with a PBD of six months. These figures confirm the ideas put forward previously. The spike in the recall hazard rate is concentrated at the exhaustion of benefits for temporary workers, and just before that for those on permanent contracts. For the new job hazard rate, the spike is concentrated at the exhaustion of benefits or one month later in both cases. Though not shown, it is interesting to highlight that the recall hazard rate and the new job hazard rate for female temporary workers type II and III workers get close at benefit exhaustion.

6.4 Sensitivity Analysis

After commenting the main results, it is worth noting that we have carried out a sensitivity analysis using different distributional assumptions for the unobserved heterogeneity terms. We have proceeded as follows. Firstly, we estimated both employment and unemployment competing risk models separately and without controlling for unobserved heterogeneity (Model I). Secondly, we estimated each of these models separately, but adding a 2-tuple distribution for the unobserved heterogeneity for employment and unemployment competing risk models and allowing the unobserved factors in the employment equation - layoff and quit hazards- to be correlated, as well as those in the unemployment equation - recall and new job entry hazards (Model II). Thirdly, we controlled for potential selection bias into multiple spells and states by estimating the employment and unemployment hazards jointly, as described in the econometric section, allowing for a full correlation structure of the unobservables (Model III).

Introducing unobserved heterogeneity, as well as jointly estimating employment and unemployment transitions, was strongly supported by the estimated sample likelihood. As we have shown in section 6.1, the estimated hazard rates strongly differ between different "worker types". Furthermore, parameter estimates – in particular, the pattern of duration dependence and UI benefits parameters - were also notably affected (see Table A2 where we present parameters estimates for models I and II).

Basically, we find that without controlling for unobserved heterogeneity and dependence between labour states, the researcher does not control properly for selection effects

biasing the estimated hazard rates (see Table 6), the estimated effects of entitlement effect on the exit probability from employment (see Table 7) or the effect of PBD on the exit probability from unemployment (see Table 8).

The variation in the estimated hazard rates is large among the three models considered (Table 6). Taking Model III as the reference, with Model I the researcher might underestimate the degree of job turnover while the opposite consequence is obtained when looking at average hazard rates of Model II. Tables 7 and 8 compare the estimated incidence of the UIS on the corresponding hazard rates for the three model specifications considered. As expected, these biases are larger in the case of the unemployment hazard rate than in the case of the employment hazard rate and in particular, in the recall hazard rate. For instance, for female workers, the exhaustion effect is clearly underestimated with Model I and overestimated with Model II. These biases have a peak around the time of benefit exhaustion.

7 Conclusions

The current design of the UIS might provide incentives for workers and employers to increase labour market turnover since the UIS appears to have a negative effect on employment duration while increasing unemployment incidence. The study reported in this paper reveals that when an employee qualifies for unemployment benefits there is a spike in the layoff hazard rate, but none in the quit hazard rate. The UIS is also found to have a major impact on unemployment duration. The recall and new job hazard rates increase notably around the time of benefit exhaustion. Interestingly, the incidence of the UIS on employment and unemployment transitions is highest for women and temporary workers; that is, for workers with loose attachment to the labour market and who suffer the largest turnover rates in Spain.

We have also presented evidence to show that the economic incentives explaining unemployment duration may differ depending on whether the shift to unemployment is due to a layoff or a quit and whether the nature of the layoff is temporary (ending in recall) or permanent (ending in new job entry). Our results suggest that cutting the entitlement period will reduce unemployment duration and, consequently, induce more employment. Nevertheless, we have also shown that these effects should not be solely attributed to a worker's behaviour. In particular, recall unemployment spells could not be explained solely

by job search behaviour, but also by firm incentives (i.e., implicit contracts between workers and firms), especially for permanent workers.

Hence, the results forthcoming show that workers and firms seem to have some influence on the timing of the outflow from both employment and unemployment and use it to their advantage whenever the current characteristics of the UIS allow. However, these incentives might generate excessive labour market turnover, with shorter employment spells and longer unemployment spells. Note that the importance of these results lies in the fact that the UIS seems to reduce the time spent in employment throughout an individual's working life by both directly increasing the probability of exit from employment and indirectly increasing unemployment duration. These findings need to be considered in the Spanish economy, in which over 80% of newly signed contracts are temporary and more than 30% of unemployed workers return to their previous firm.

Given these results, a potential reform of the UIS designed to reduce the average unemployment duration and the unemployment rate should consider both sides of the labour market: on the one hand, the current design of the UIS distorts a firm's hiring and firing decisions, and on the other hand, it also has behavioural consequences on a worker's decisions.

8 References

Abbring, J.H. and G.J. van den Berg (2004), "Analyzing the effect of dynamically assigned treatments using duration models, binary treatment models, and panel data models", *Empirical Economics*, vol. 29, pp. 5-40.

Alba-Ramirez, A., Arranz, J.M. and Muñoz-Bullón, F. (2007): "Exits from unemployment: Recall or new job", *Labour Economics (14)*, pp 788-810.

Anderson, P. M. and Meyer, B.D. (1993): "Unemployment Insurance in the United States: Layoff Incentives and Cross Subsidies", *Journal of Labor Economics*, University of Chicago Press, vol. 11(1), pp.70-95.

Anderson, P. M. and Meyer, B.D. (2000): "The effects of the unemployment insurance payroll tax on wages, employment, claims and denials" *Journal of Public Economics*, Vol. 78(1-2), pp. 81-106

Bailey MN. (1977): "On the theory of layoffs and unemployment", *Econometrica* 45, pp. 1043–1063.

Baker, M. and Melino, A. (2000): "Duration Dependence and nonparametric heterogeneity: A Monte Carlo Study", *Journal of Econometrics,* 96, pp. 357-393

Baker, M. and Rea, S.A. (1998): "Employment Spells and Unemployment Insurance

Eligibility Requirements" *The Review of Economics and Statistics*, MIT Press, vol. 80(1), pp. 80-94.

Bassanini, A., L. Nunziata, and D. Venn (2008), "Job Protection Legislation and Productivity Growth in OECD Countries", IZA Discussion Paper No. 3555.

Belzil, C. (2001): "Unemployment insurance and subsequent job duration: job matching versus unobserved heterogeneity", *Journal of Applied Econometrics*, Vol. 16(5), pp. 619-636.

Blanchard, O.J. and Tirole, J. (2008): "The Joint Design of unemployment insurance and Employment Protection: A First Pass" *Journal of the European Economic Association*, Vol. 6, No. 1, pp. 45-77.

Boone, J. and Van Ours, J. C. (2009): "Why is there a spike in the job finding rate at benefit exhaustion?," CEPR Discussion Papers 7525.

Bover, O., Arellano, M. and Bentolila, S. (2002): "Unemployment duration, benefit duration and the business cycle", *The Economic Journal,* 112*,* pp. 223-265.

Bover, O. and Gomez, R. (2004): "Another look at unemployment duration: exit to a permanent vs. a temporary job", *Investigaciones Económicas,* vol XXVIII (2)*,* pp. 285-314.

Brinch, C. (2000): "Identification of structural duration dependence and unobserved heterogeneity with time-varying covariates", Memorandum 20/2000, Oslo University, Department of Economics.

Burdett, K. (1978):"A Theory of Employee Job Search and Quit Rates", *American Economic Review*, 68(1), pp.212-220.

Burdett K, Wright R. (1989): "Optimal firm size, taxes, and unemployment" *Journal of Public Economics* 39, pp.275–287.

Caliendo, M. amd Tatsiramos, K. and Uhlendorff, A. (2009): "Benefit Duration, Unemployment Duration and Job Match Quality: A Regression-Discontinuity Approach", IZA Discussion Papers 4670.

Centeno, M. (2004): "The match quality gains from Unemployment Insurance", *Journal of Human Resources* Vol. 39(3).

Card, D. and Chetty, R. and Weber, A. (2007): "The Spike at Benefit exhaustion: leaving the unemployment system or starting a new job?", *American Economic Review*, 97, pp.113–118.

Cahuc, P. and Malherbet, F. (2004): "Unemployment compensation finance and labour market rigidity" *Journal of Public Economics*, vol. 88(3-4), pp.481-501.

Christofides, L. N. and McKenna, C.J. (1996): "Unemployment Insurance and Employment Patterns in Canada" Canadian Journal of Economics, Canadian Economics Association, vol. 29(s1), pp.8-11.

Dolado, J.J. and Stucchi, R. (2008): "Do Temporary Contracts Affect TFP? Evidence from Spanish Manufacturing Firms" IZA Discussion Papers Nº 3832-

Duran, A. (2007): "La Muestra Continua de Vidas Laborales de la Seguridad Social", Revista del Ministerio de Trabajo y Asuntos Sociales, Nº1, pp.231-240

Fath, J. and Fuest, C. (2005): "Risk aversion does not justify the introduction of mandatory unemployment insurance in the shirking model", Working Paper Series in Economics 19, University of Cologne, Department of Economics.

Feldstein M. (1976): “Temporary layoffs in the theory of unemployment”. *Journal of Political Economy* 84, pp. 937–957.

Feldstein M. (1978): “The effect of unemployment insurance on temporary layoff unemployment”. *The American Economic Review* 65, pp. 834–846.

Gagliarducci, S. (2005): “The Dynamics of Repeated Temporary Jobs”, *Labour Economics,* Vol 12, Nº4, pp.429-448.

García Pérez, J.I (2008): “La Muestra Continua de Vidas laborales (MCVL): una guía de uso para el análisis de transiciones laborales”. *Revista de Economía Aplicada,* XVI(E-I), pp.5-28.

Gaure, S., Roed, K. and Zhang, T. (2007): “Time and Causality: a Monte Carlo assessment of the timing-of-events approach”, *Journal of Econometrics*, Vol 141, pp. 1159-1195.

Green, D.A and Riddell, W C. (1997): “Qualifying for Unemployment Insurance: An Empirical Analysis”, *Economic Journal*, Royal Economic Society, vol. 107(440), pp. 67-84.

Green, D.A and Sargent,T. (1998): “Unemployment Insurance and Job Durations: Seasonal and Non-Seasonal Jobs”, *Canadian Journal of Economics*, Canadian Economics Association, vol. 31(2), pp. 247-278.

Grubb, D. (2011): “Assessing the impact of recent unemployment insurance extensions in the united states” OECD Working Paper

Ham, J. and LaLonde, R. (1996): “The effect of sample selection and initial conditions in duration models: evidence from experimental data on training”, *Econometrica* 64, pp. 175-206.

Heckman, J.J. y Singer, B. (1984): “The Identifiability of the proportional hazard model”, *Review of Economic Studies*, 51, pp.231-241.

Hougaard, P. (1998): “Frailty” En: Armitage, P. y Colton, T. (editors). Encyclopedia of Biostatistics. N.Y.: John Wiley and Sons. pp. 1572-1577.

Jenkins, S. (1995): “Easy Estimation Methods for Discrete Time Duration Models”, *Oxford Bulletin of Economics and Statistics*, 57(1), pp.129-137.

Jensen P, Westergaard-Nielsen N (1990) “Temporary layoffs” In: *Panel Data and Labor Market Studies*, Hartog J, Ridder G, Theeuwes J (eds). North-Holland: Amsterdam.

Jurajda, S., (2002): “Estimating the effect of unemployment insurance compensation on the labor market histories of displaced workers”, *Journal of Econometrics*, vol. 108(2), pp. 227-252, June.

Jurajda, S., (2003): “Unemployment Insurance and the Timing of Layoffs and Recalls” *Labour*, CEIS, Fondazione Giacomo Brodolini and Blackwell Publishing Ltd, vol. 17(3), pp 383-389.

Katz, L. (1986): “Layoffs, recall and the duration of unemployment” NBER working paper Nº 1825.

Katz, L.F. y Meyer, B.D (1990): “Unemployment Insurance, Recall Expectations and Unemployment Outcomes”, *Quarterly Journal of Economics*, 105, pp. 973-1002.

Lalive, R. (2007). "Unemployment Benefits, Unemployment Duration, and Post-Unemployment Jobs: A Regression Discontinuity Approach." *American Economic Review*, 91(2), pp. 108-112.

Meyer, B. D., (1990): "Unemployment Insurance and Unemployment Spells" *Econometrica*, vol. 58(4), pp. 757-782.

Moore, J.C. (2008): "Seam Bias in the 2004 SIPP panel: much improved, but much bias still remains" U.S. Census Bureau Statistical Research Division Survey Methodology Research Report Series 2008-3.

Mortensen, D.T. (1990): "A structural model of unemployment insurance benefit effects on the incidence and duration of unemployment" in *Advances in the Theory and Measurement of Unemployment*; Weiss Y, Fishelson G (eds). Macmillan: London.

Roed, K. and Nordberg, M. (2003): "Temporary layoffs and the duration of unemployment", *Labour Economics*, vol. (10), pp. 381-398.

Roed, K. and Zhang, T. (2003): "Does unemployment compensation affect unemployment duration?" *Economic Journal*, 113, pp. 1-19.

Rebollo, Y. F. (2011): "The role of job interruptions, temporary contracts and multi-firm experiences in the temporality trap in Spain" *The Manchester School Vol 79, Nº6 pp. 1197-1236*

Topel, R.H, (1983): "On Layoffs and Unemployment Insurance", *American Economic Review*, American Economic Association, vol. 73(4), pp. 541-559.

Van den Berg G.J. and Van Ours, J. (1994): "Unemployment Dynamics and duration dependence in France, the Netherlands and the United Kingdom" *Economic Journal* 104, 432-443.

Van den Berg G.J. and Van Ours, J. (1996): "Unemployment Dynamics and duration dependence", *Journal of Labour Economics* 14, 100-125.

Van Ours, J. and Vodopivec, M. (2008): "Shortening the potential duration of unemployment benefits does not affect the quality of post-unemployment jobs: evidence from a natural experiment" IZA discussion paper 2171.

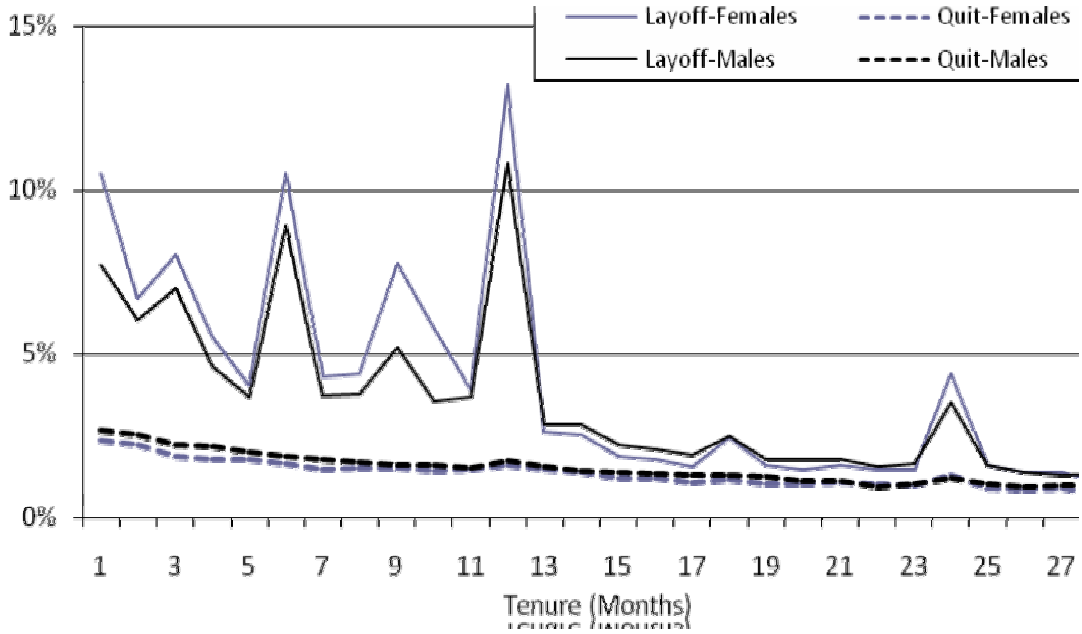
Tables and Figures

Table 1: Overview of recorded events/outcomes

	Females	Males
Sample of Employment Spells		
Completed Spells	76.2% (13.5)*	75.5% (15.6)
Percentage ending in:		
Layoffs	80.4% (13.3)	75.4% (15.7)
Quits	19.6% (14.5)	24.6% (15.1)
Sample of Involuntary Unemployment Spells		
Completed Involuntary Unemployment Spells	90.0% (7.4)	86.8% (6.3)
Percentage ending in:		
Recall	45.2% (3.7)	34.8% (3.4)
Different firm	52.8% (7.4)	65.2% (5.3)
Sample of Voluntary Unemployment Spells		
Completed Voluntary Unemployment Spells [34]	94.8% (4.5)	90.4% (3.5)

* (Mean duration in months)

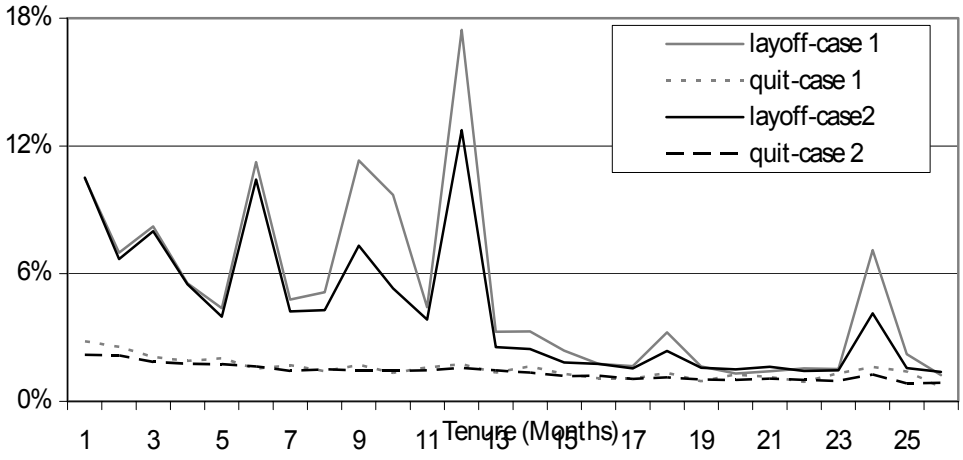
Figure 1: Employment Hazard Rate with two competing risks: layoff versus quit



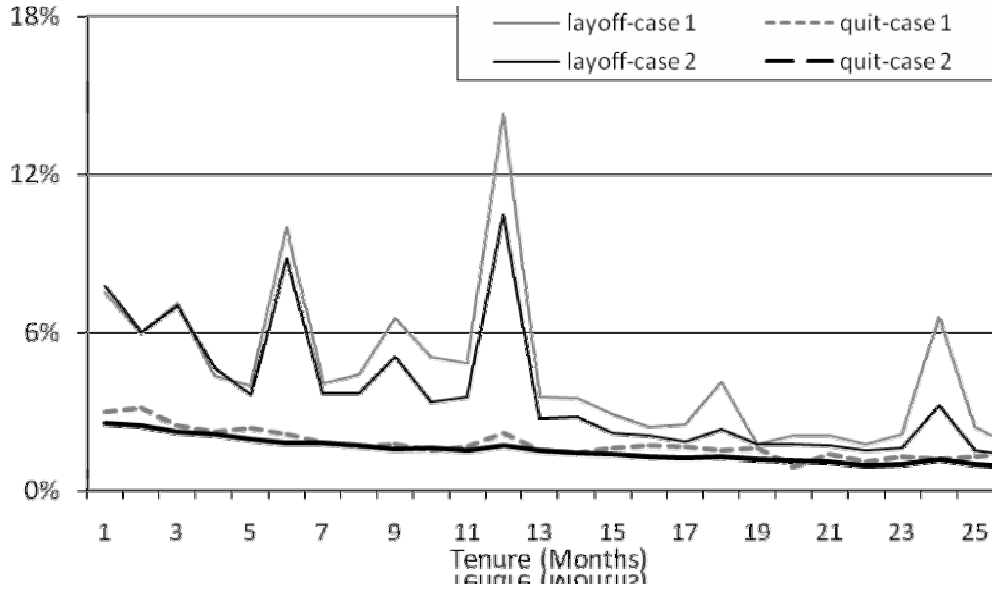
[34] No more than 5% of these observations end up back in the same firm.

Figure 2: Testing for the empirical relation between the qualifying period and the employment hazard rate

Females



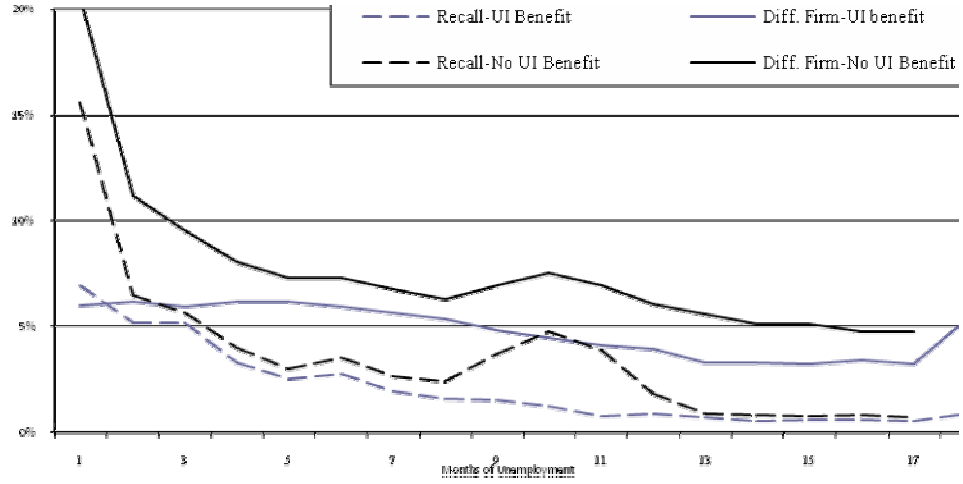
Males



* Case 1= The qualifying period at the beginning of the current employment spell was zero; Case 2= The qualifying period at the beginning of the current employment spell was positive

Figure 3: Unemployment Hazard Rate for UI Benefit receivers and non receivers: recall versus new job entry.

Females



Males

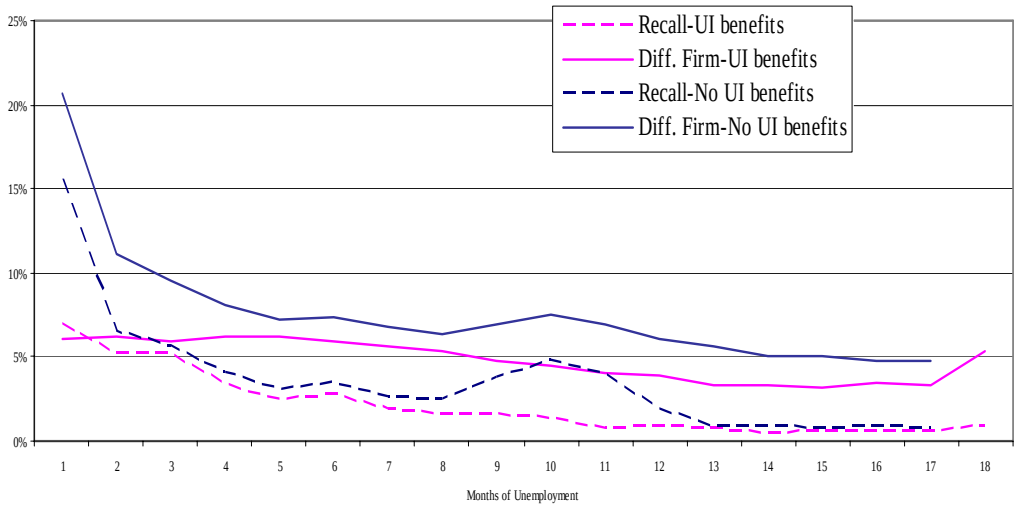


Figure 4: Unemployment Hazard Rate for UI benefits receivers with two competing risks: recall versus new job entry Case 1: worker´s PBD=4 months; Case 2: worker´s PBD=6 months.

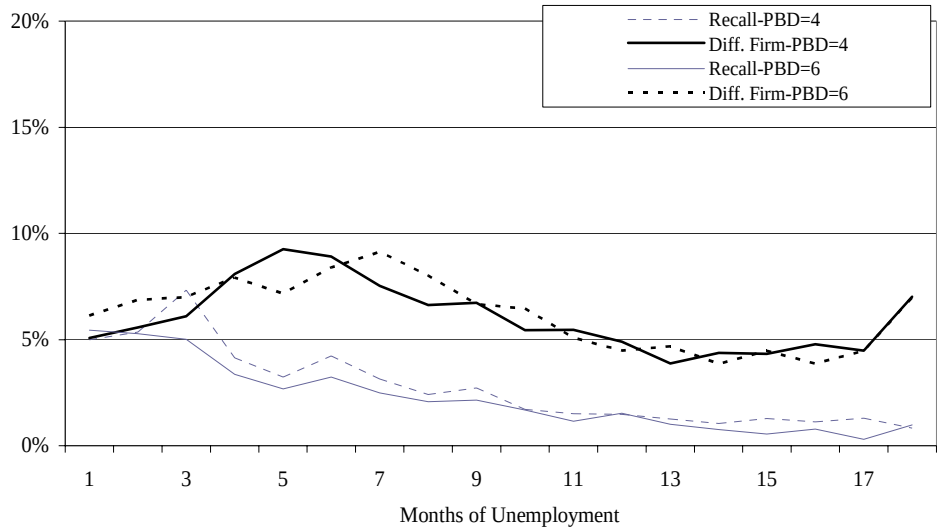
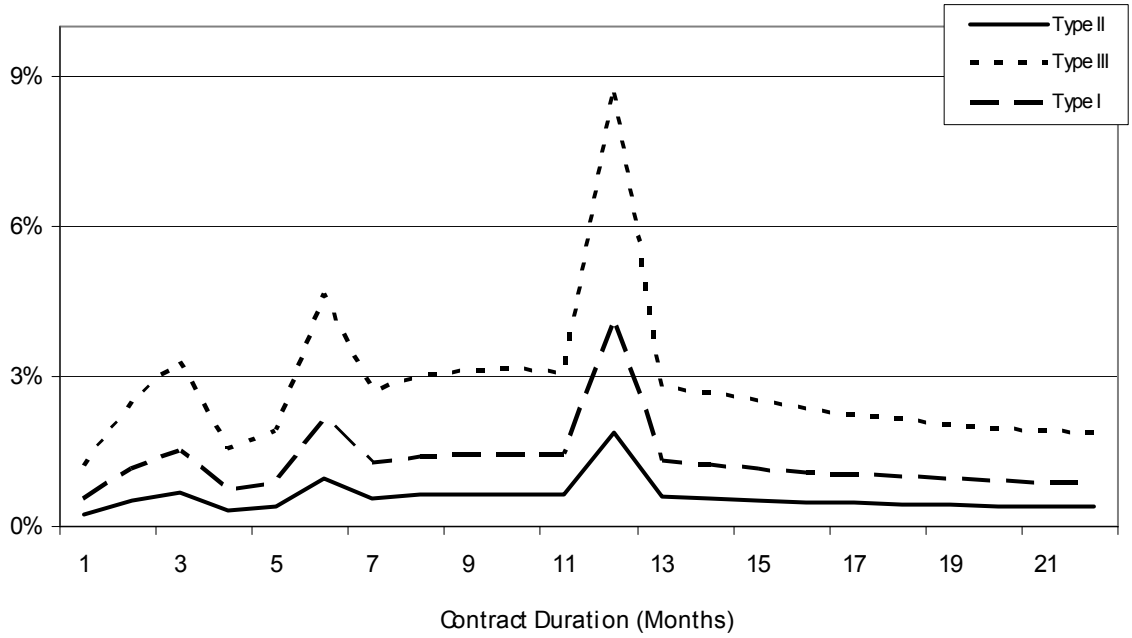


Table 2: Main Sample Statistics

		Men			Women		
		Employment	Unemp. (layoff)	Unemp. (quit)	Employment	Unemp. (layoff)	Unemp. (quit)
Individual Characteristics	Age	32.2	31.2	27.8	31.1	31.0	27.4
	Experience (years)	12.8	8.3	4.3	10.9	7.4	4.4
	Immigrant	9.3%	10.7%	21.1%	4.2%	4.4%	9.9%
	Receive Assistant Benefits		6.8%	0.6%		9.4%	0.5%
Job Characteristics							
	Part-time	7.8%	16.1%	27.8%	24.9%	32.4%	48.7%
Job Qualification	High	37.9%	20.9%	18.5%	43.3%	25.0%	21.9%
	Medium	33.7%	32.9%	32.3%	32.1%	35.6%	35.6%
	Low	28.4%	46.2%	49.2%	24.6%	39.3%	42.5%
Sector of Activity	Construction	19.2%	23.6%	22.1%	2.8%	2.4%	2.3%
	Industry	21.9%	16.7%	11.2%	11.3%	11.8%	7.1%
	Service	59.0%	59.7%	66.7%	85.9%	85.8%	90.7%
Firm Size	> 50 Employees	33.8%	11.0%	22.8%	37.1%	31.0%	27.0%
	50-20 Employees	12.9%	16.4%	11.4%	10.9%	10.3%	9.5%
	20-5 Employees	17.6%	46.0%	16.9%	15.4%	15.0%	14.6%
	<5 Employees	35.7%	11.0%	48.9%	36.7%	43.7%	48.9%
Public Firm		6.4%	-10.2	1.6%	13.1%	14.2%	2.9%
Permanent Contract		62.3%	15.6%	27.1%	59.7%	16.2%	-0.921
Permanent Contract (intermittent)		0.5%	1.8%	0.5%	1.9%	4.0%	1.4%
Temporary Help Agency		9.1%	7.6%	5.9%	16.1%	18.0%	5.4%
Aggregate Variables							
Regional Unemp. Rate (quarterly)		11.4%	10.8%	10.0%	10.9%	10.6%	9.9%
GDP growth rate (quarterly)		1.8%	1.8%	1.8%	1.8%	1.8%	1.8%

Figure 5: Estimated Layoff Hazard Rate.

Females



Males

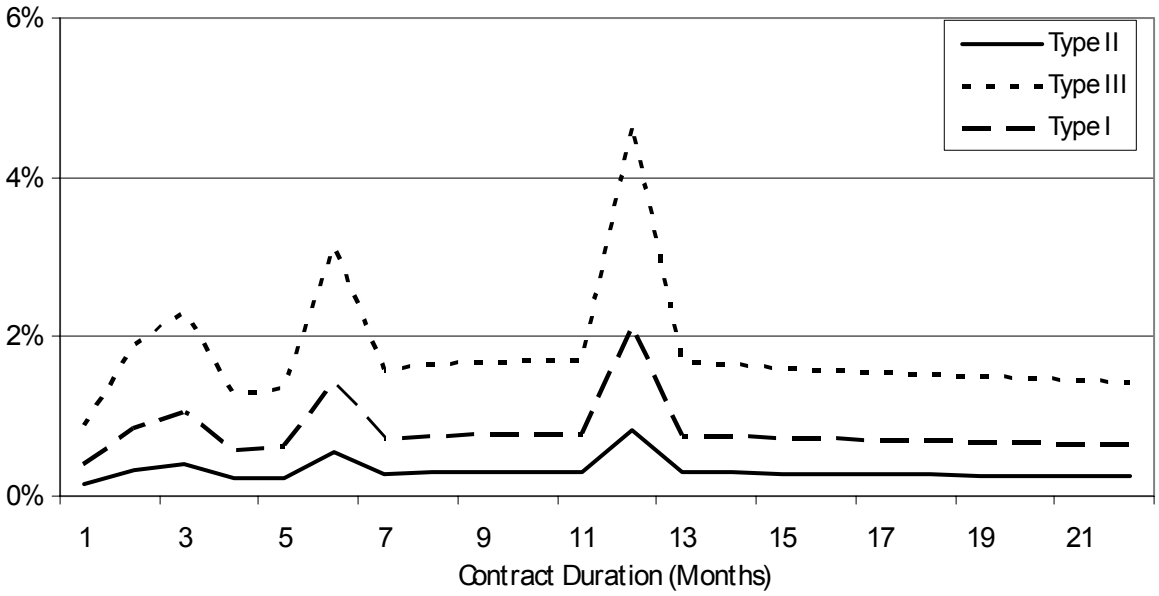
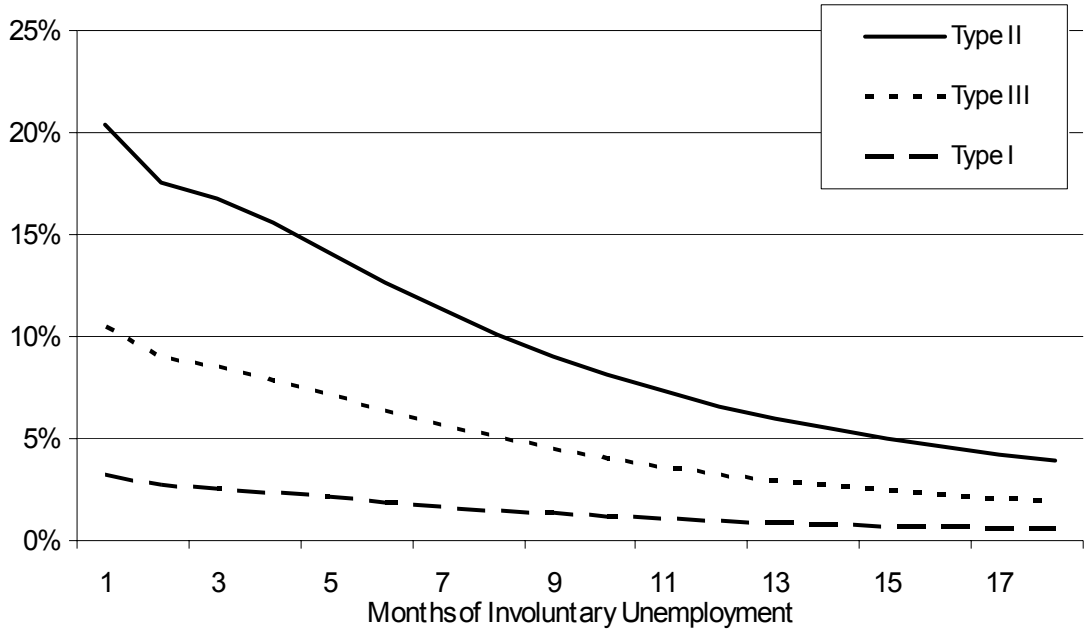


Figure 6: Estimated Recall Hazard Rate.

Females



Males

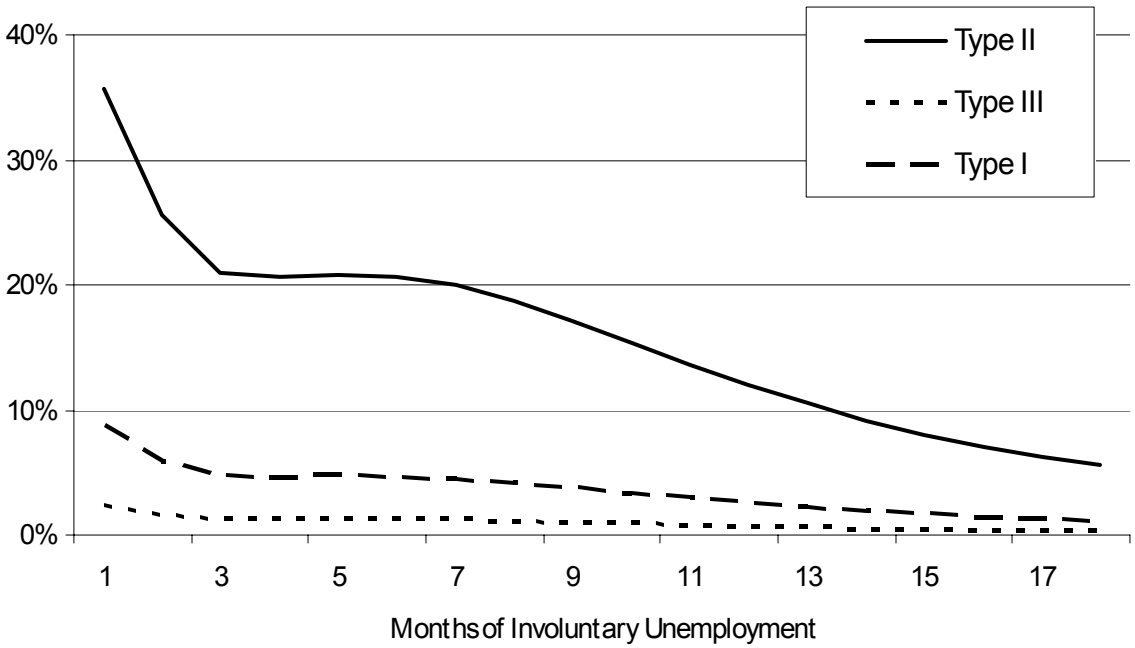


Figure 7: Estimated New-Job Hazard Rate.

Females

Males

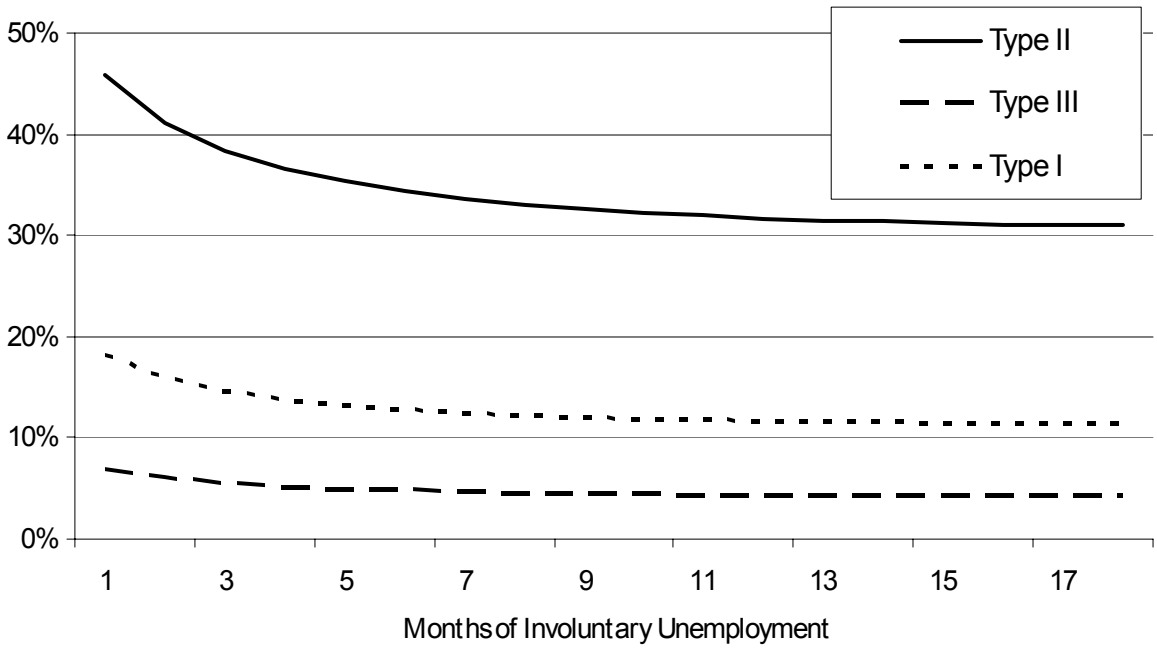
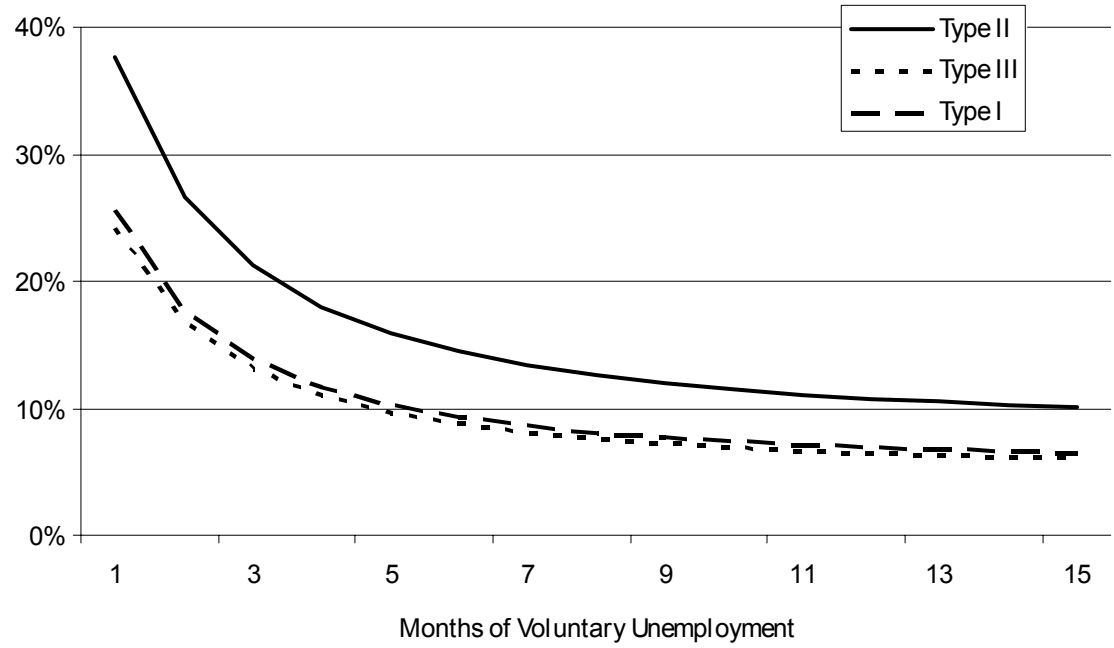


Figure 8: Estimated Voluntary Unemployment Hazard Rate.

Females



Males

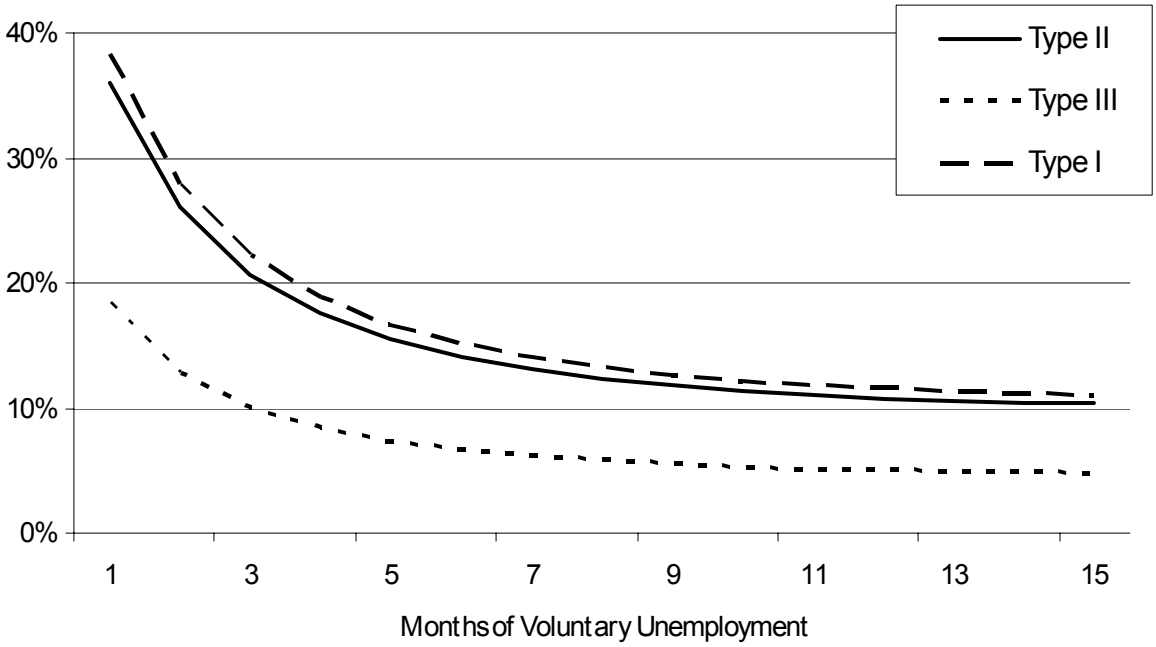
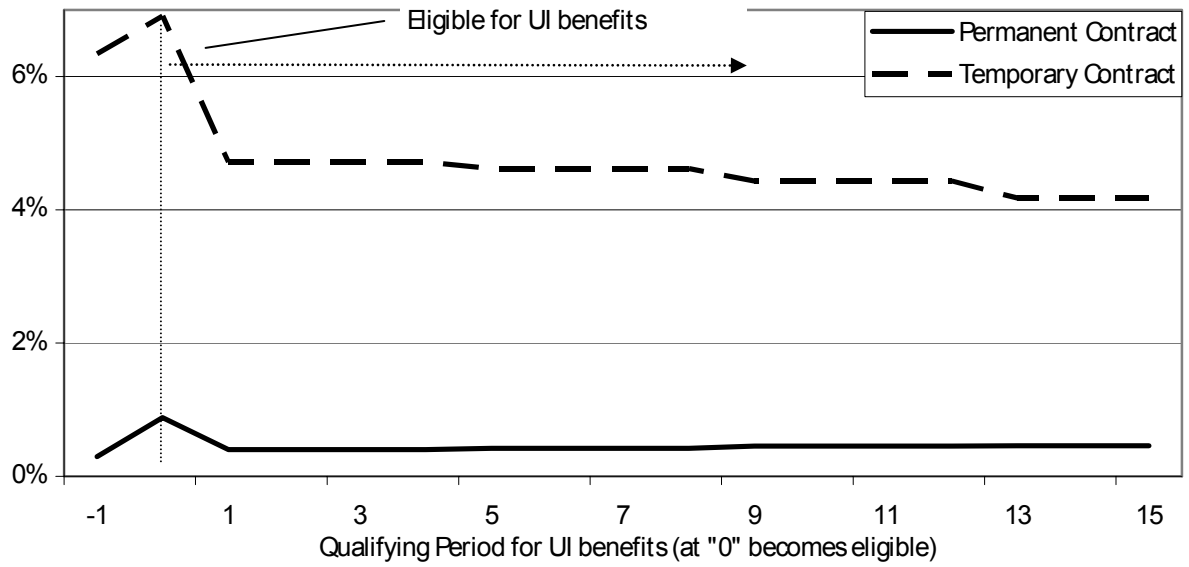


Table 3: Estimated Average Hazard Rates and Unobserved Heterogeneity

	Women			Men		
Unobserved Heterogeneity	**Type I**	**Type II**	**Type III**	**Type I**	**Type II**	**Type III**
Prob. of	47.14%	28.77%	24.08%	57.40%	20.33%	22.26%
Estimated Hazard of:						
Layoff	0.50%	0.26%	1.20%	0.70%	0.29%	1.60%
quit	0.15%	0.07%	0.39%	0.20%	0.09%	0.55%
Recall	1.62%	10.71%	4.60%	4.22%	18.80%	1.17%
New Job	5.49%	20.34%	8.62%	13.94%	36.69%	5.35%
Volunt. Unemp.	11.14%	17.27%	10.94%	18.21%	16.99%	8.14%

Figure 9: Layoff Probability from Employment in relation to the UI qualifying period

Females



Males

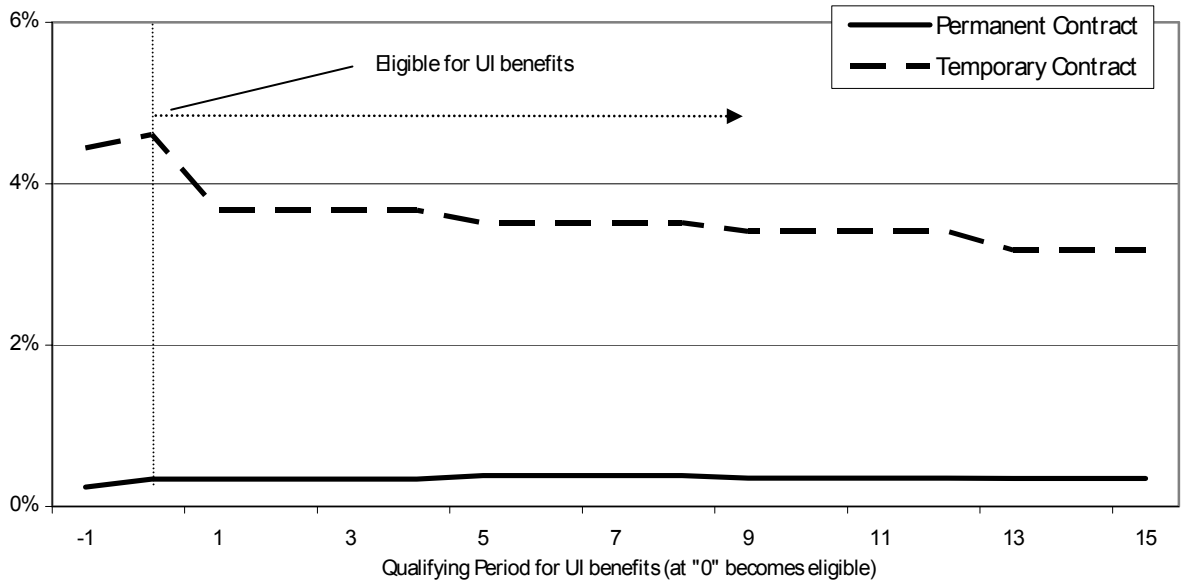


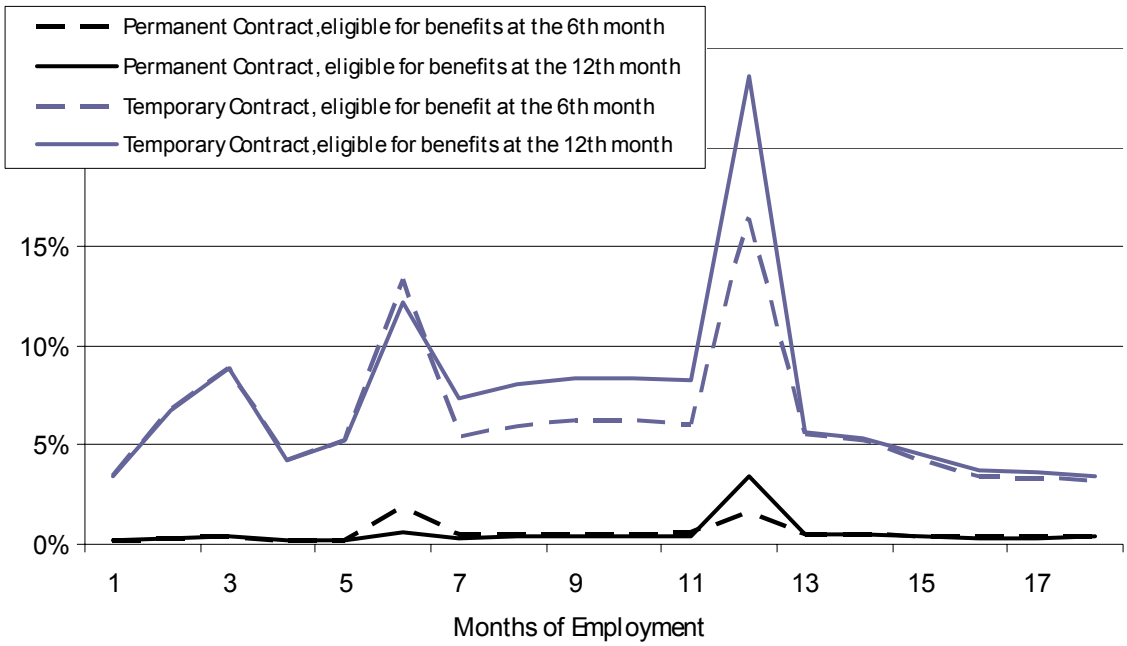
Table 4: Variation in the employment hazard rate due to the entitlement for UI benefits (variation in percentage points relative to the previous month)

			Reasons for ending the contract	
	Type of Contract	**UI Entitlement Effect**	Layoff	Quit
Women	Permanent	When qualifying for benefits	0.60**	0.02
		After qualifying for benefits		
		Between 1-4 months	-0.49	-0.03
		Between 5-8 months	0.02*	0.00
		Between 9-12 months	0.03	-0.01
	Temporary	When qualifying for benefits	0.62*	-0.13*
		After qualifying for benefits		
		Between 1-4 months	-2.33**	-0.07**
		Between 5-8 months	-0.09**	-0.03*
		Between 9-12 months	-0.21**	-0.03**
Men	Permanent	When qualifying for benefits	0.10*	0.03
		After qualifying for benefits		
		Between 1-4 months	0.00**	0.00**
		Between 5-8 months	0.04**	-0.01**
		Between 9-12 months	-0.03**	0.01**
	Temporary	When qualifying for benefits	0.18*	-0.06**
		After qualifying for benefits		
		Between 1-4 months	-0.95*	0.01**
		Between 5-8 months	-0.16**	-0.04**
		Between 9-12 months	-0.11**	-0.02

Note 1: ** The parameters associated to this effect are statistically significant at the 95% level; * The parameters associated to this effect are statistically significant at the 90% level

Figure 9: Exit Probability from Employment due to a layoff by gender

Females



Males

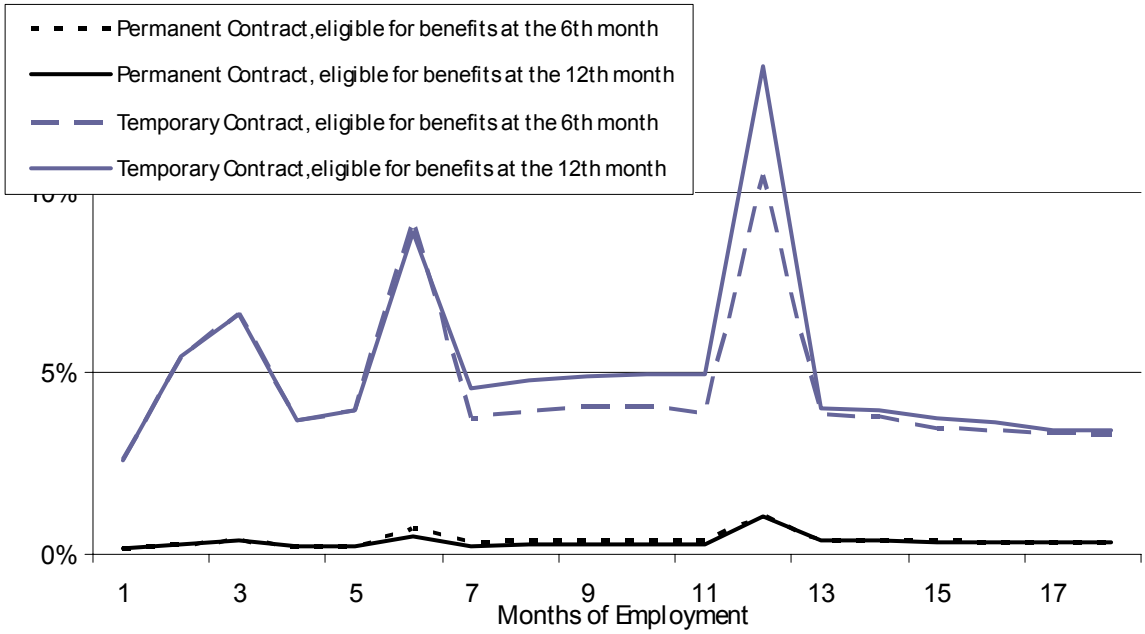
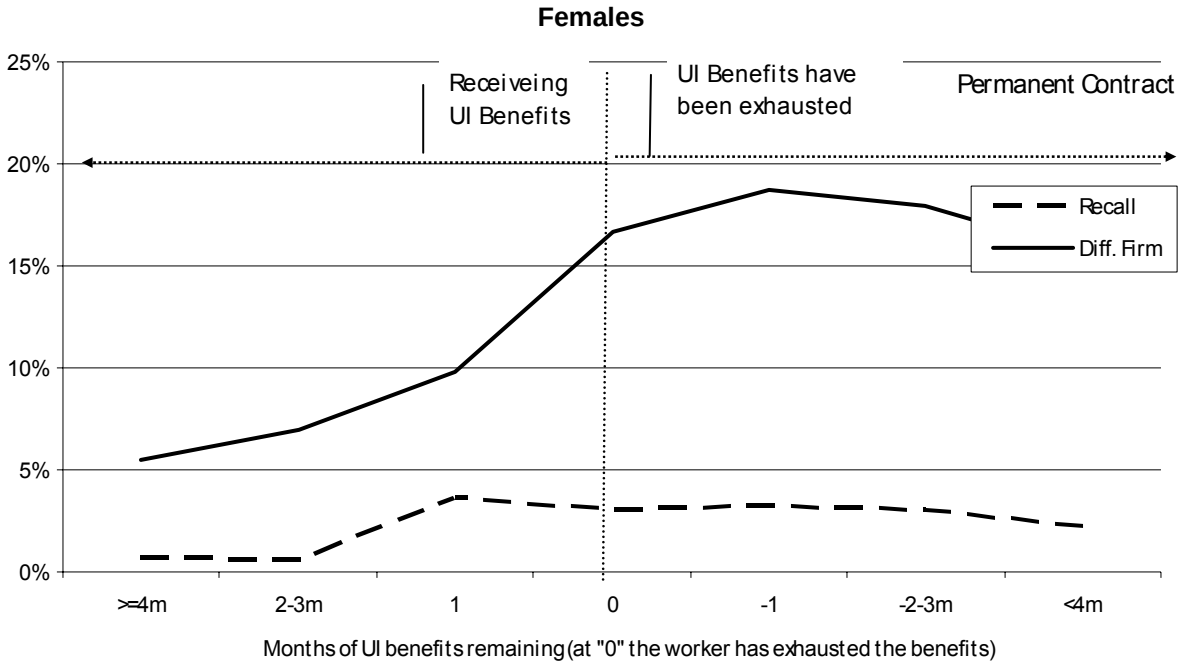


Figure 11: Exit Probability from Involuntary Unemployment in relation to the months left to exhaust UI benefits, by gender and type of contract



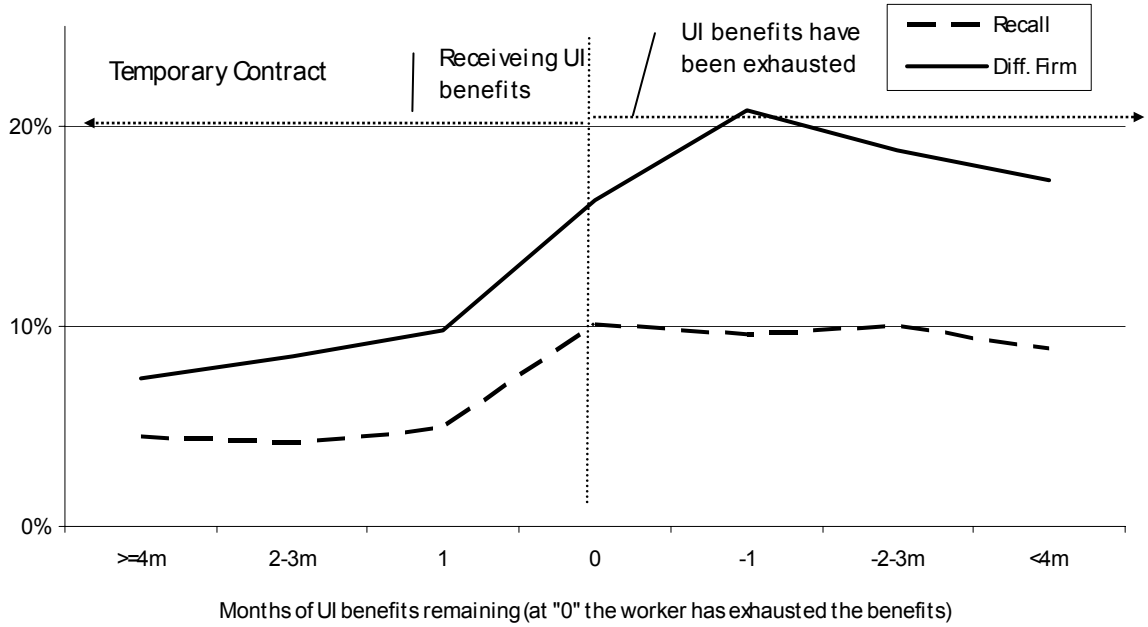
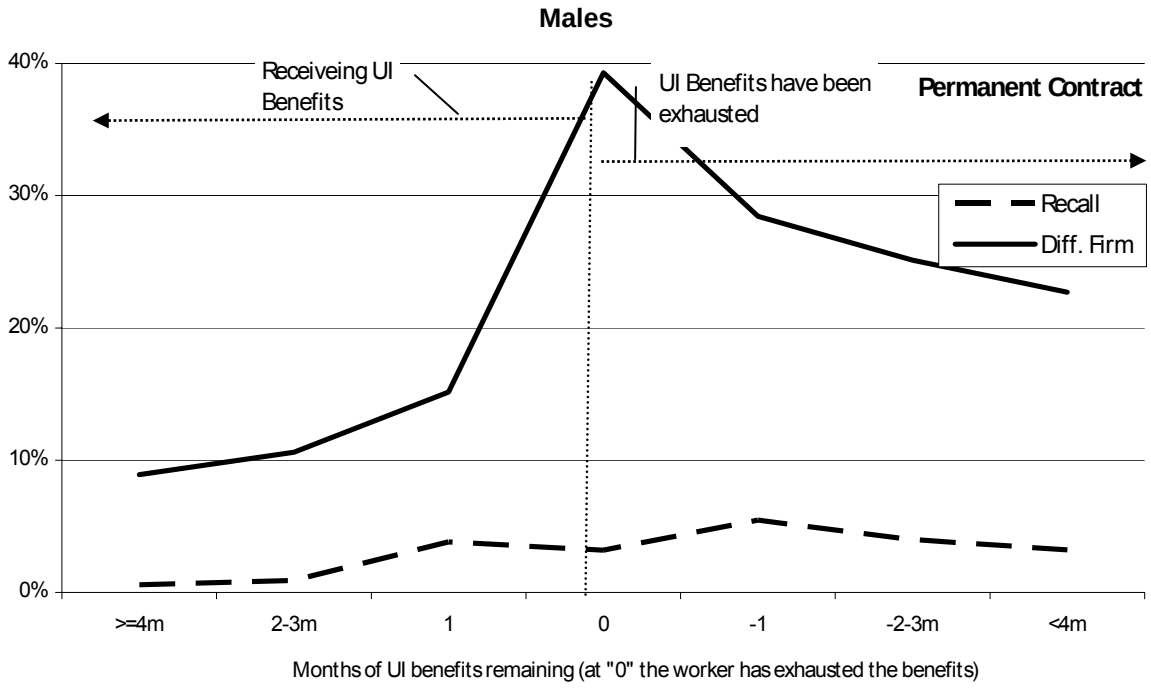


Figure 11: Exit Probability from Involuntary Unemployment in relation to the months left to exhaust UI benefits, by gender and type of contract (continued)



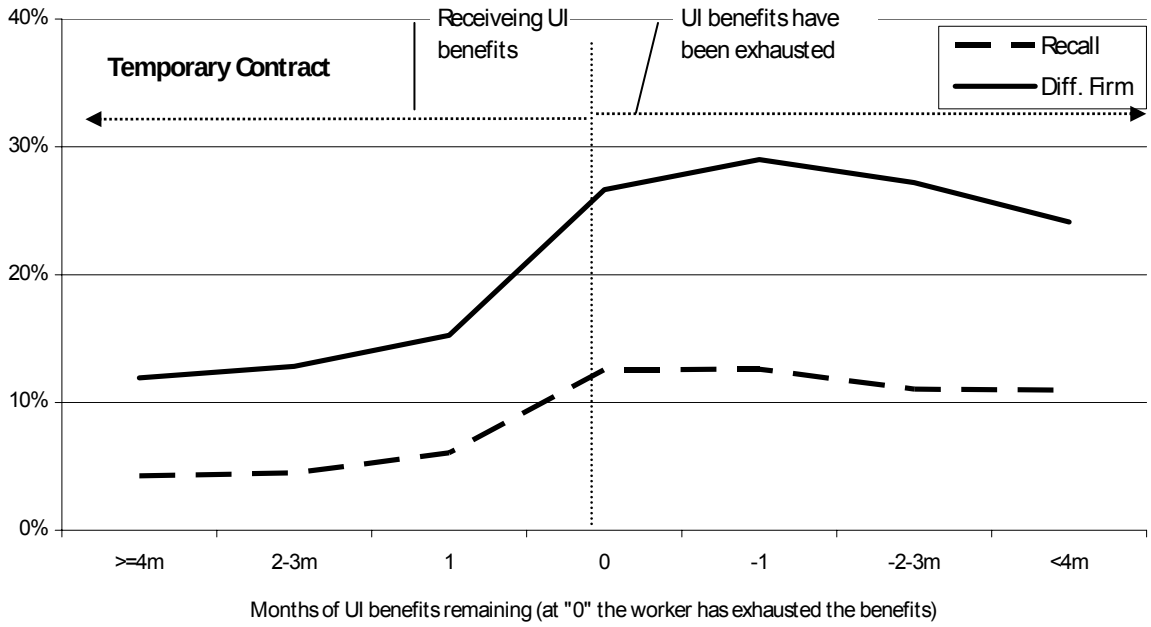
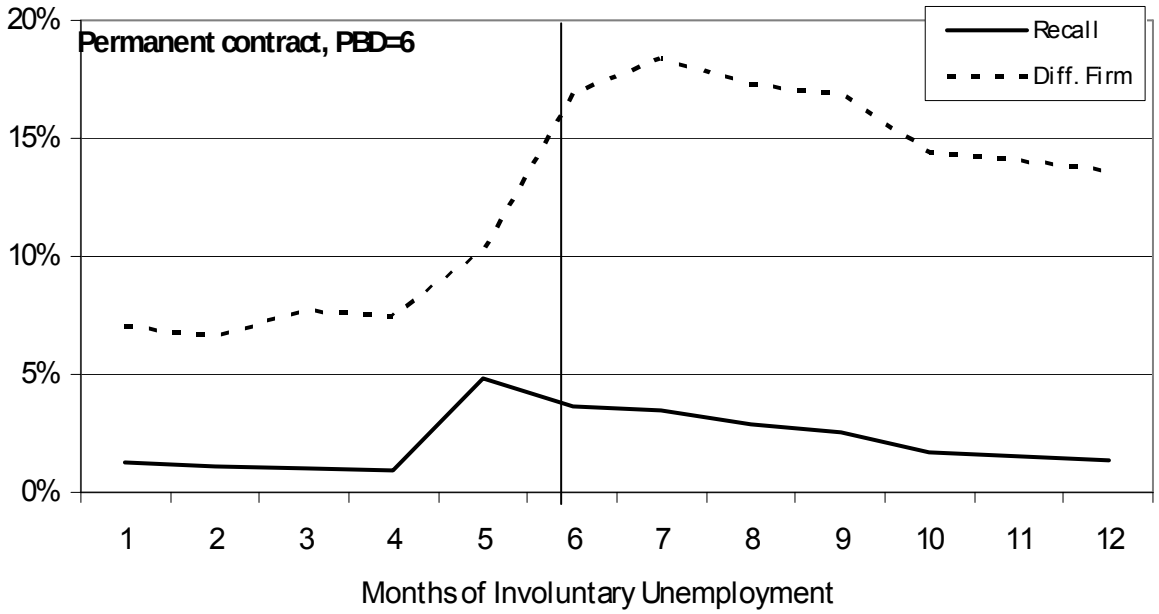


Table 5: Estimated variation in the involuntary unemployment hazard rate due to UI benefits exhaustion (percentage points relative to the previous month)

			Type of Transition	
			Recall	New Job
Women	Permanent	One month prior to exhaustion	2.96**	2.89**
		UI exhausted	-0.59*	6.80
		One month following exhaustion	0.29**	2.02**
	Temporary	One month prior to exhaustion	0.70**	1.39**
		UI exhausted	5.02*	6.40**
		One month following exhaustion	-0.41*	4.36**
Men	Permanent	One month prior to exhaustion	2.99**	4.56**
		UI exhausted	-0.63*	24.15**
		One month following exhaustion	2.35**	-10.85**
	Temporary	One month prior to exhaustion	1.61**	2.43**
		UI exhausted	6.66**	11.39**
		One month following exhaustion	0.08*	2.39**

Same as note 1

Figure 12: Involuntary Unemployment Hazard Rate in relation to duration of Unemployment for PBD=6 months (Females)



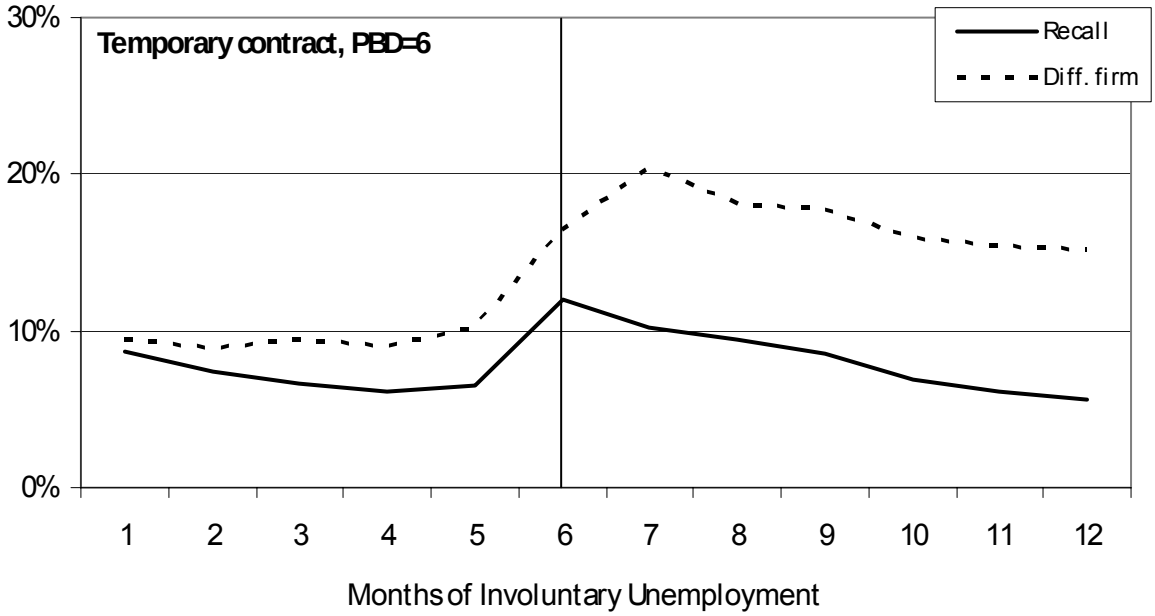


Figure 12: Involuntary Unemployment Hazard Rate in relation to duration of Unemployment for PBD=6 months (Males)

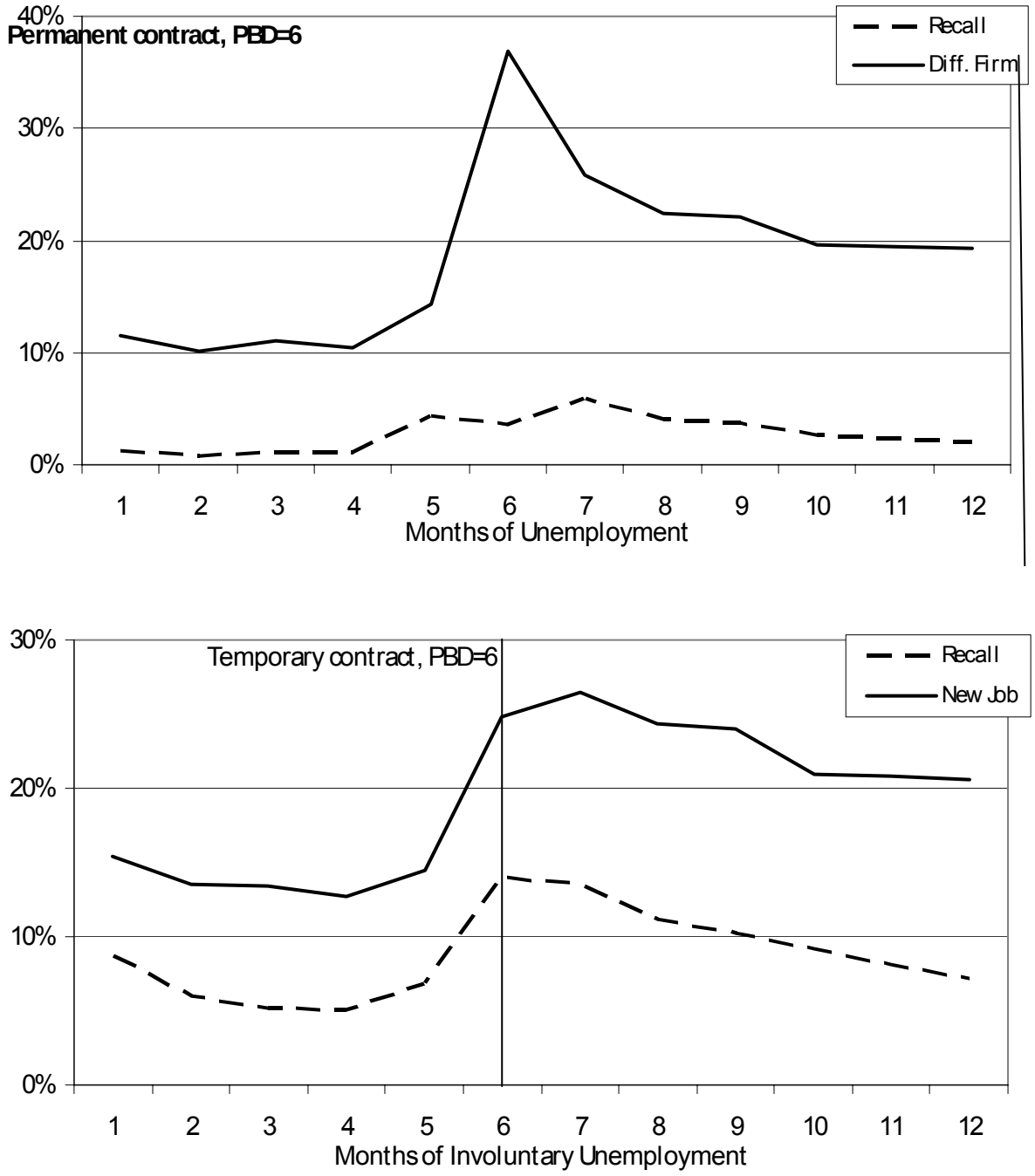


Table 6: Comparing Results between different model specifications: Average Estimated Hazards Rates

		Model I	Model II			Model III		
			Type I	Type II	Type III	Type I	Type II	Type III
Men	**Layoff**	0.75%	0.88%	0.30%	2.05%	0.70%	0.29%	1.60%
	quit	0.23%	0.20%	0.12%	0.79%	0.20%	0.09%	0.55%
Share (worker type)		-	41.32%	42.25%	16.43%	57.40%	20.33%	22.26%
	Recall	3.03%	5.94%	28.23%	1.49%	4.22%	18.80%	1.17%
	New Job	10.93%	17.68%	49.65%	6.59%	13.94%	36.69%	5.35%
Share (worker type)		-	50.06%	11.26%	38.68%	57.40%	20.33%	22.26%
	Volunt. Unemp.	32.39%	26.08%	2.56%	10.15%	18.21%	16.99%	8.14%
Share (worker type)		-	65.00%	6.17%	28.84%	57.40%	20.33%	22.26%
Women	**Layoff**	1.04%	1.19%	0.35%	3.55%	0.50%	0.26%	1.20%
	quiit	0.27%	0.28%	0.12%	1.09%	0.15%	0.07%	0.39%
Share (worker type)		-	57.85%	31.15%	11.00%	47.14%	28.77%	24.08%
	Recall	3.12%	1.70%	27.69%	5.98%	1.62%	10.71%	4.60%
	New Job	7.40%	4.99%	43.22%	13.41%	5.49%	20.34%	8.62%
Share (worker type)		-	50.05%	7.84%	42.11%	47.14%	28.77%	24.08%
	Volunt. Unemp.	12.33%	36.85%	16.03%	4.90%	11.14%	17.27%	10.94%
Share (worker type)		-	13.52%	67.37%	19.11%	47.14%	28.77%	24.08%

Note 2: Model I: Duration Model without controlling for unobserved heterogeneity; Model II: Duration Model controlling for unobserved heterogeneity but assuming independence between labour market states; Model III: Duration Model controlling for unobserved heterogeneity and allowing for a full correlation structure between transitions and labour states.

Table 7: Comparing Results between different model specifications: Variation in employment exit probability due to the entitlement for UI benefits (variation in percentage points relative to previous month)

			Permanent Contract			Temporary Contract		
			Model I	Model II	Model III	Model I	Model II	Model III
Women	**Layoff**	When qualifying for benefits	0.63	0.58	0.60	0.54	0.70	0.60
		After qualifying for benefits	-0.53	-0.47	-0.49	-1.89	-2.33	-2.23
	Quit	When qualifying for benefits	0.04	0.03	-0.03	-0.13	-0.15	-0.13
		After qualifying for benefits	-0.03	-0.02	-0.01	-0.03	-0.05	-0.07
Men	**Layoff**	When qualifying for benefits	0.12	0.09	0.10	0.15	0.21	0.18
		After qualifying for benefits	-0.01	0.00	0.00	-0.84	-0.99	-0.95
	Quit	When qualifying for benefits	0.04	0.04	0.04	-0.06	-0.06	-0.06
		After qualifying for benefits	0.00	0.03	0.00	0.02	-0.01	-0.02

Same as note 2

Table 8: Comparing Results between different model specifications: estimated variation of the unemployment exit probability due to UI benefits exhaustion (variation in percentage points relative to previous month)

			Permanent Contract			Temporary Contract		
			Model I	Model II	Model III	Model I	Model II	Model III
Women	**Recall**	One month prior to exhaustion	1.77	3.31	2.96	0.66	0.77	0.70
		UI exhausted	-0.62	-0.76	-0.59	3.07	5.45	5.02
		One month following exhaustion	0.03	0.30	0.31	-0.84	-0.69	-0.41
	New Job	One month prior to exhaustion	1.70	2.99	2.89	1.08	1.46	1.39
		UI exhausted	5.70	6.93	6.80	4.17	6.61	6.40
		One month following exhaustion	1.32	1.85	2.02	2.97	4.12	4.36
Men	**Recall**	One month prior to exhaustion	1.33	2.80	2.99	0.92	1.61	1.61
		UI exhausted	-0.51	-0.49	-0.63	2.68	6.55	6.66
		One month following exhaustion	1.45	3.80	2.35	-0.13	0.22	0.08
	New Job	One month prior to exhaustion	3.30	4.76	4.56	1.82	2.42	2.43
		UI exhausted	21.43	23.98	24.15	7.69	11.36	11.39
		One month following exhaustion	-11.54	-10.40	-10.85	1.87	2.64	2.39

Same as note 2

Appendix

Table A1: Results of the MMPH Model: Part 1: Involuntary Unemployment Hazard Rate

		Men				Women			
		Recall		Diff. Firm		Recall		Diff. Firm	
		Coef.	t-s	Coef.	t-s	Coef.	t-s	Coef.	t-s
Individual Characteristics	Age (years/10)	0.037	4.1	-0.118	-8.6	0.146	14.5	-0.198	-20.0
	Experience (years/10)	0.334	14.2	0.231	13.9	0.155	11.0	0.101	8.0
	Immigrant	0.219	7.0	0.230	11.5	-0.206	-6.6	0.122	5.9
Job Characteristics	Part-Time Job	-0.138	-6.5	-0.386	-26.1	-0.019	-1.2	-0.164	-16.2
Job Qualification	Medium	0.069	4.1	0.081	7.6	-0.049	-2.8	0.129	12.8
	High	0.074	2.6	0.009	-0.3	0.187	11.6	0.123	10.1
Sector of Activity	Construction	0.400	21.3	0.198	16.3	-0.371	-8.2	-0.101	-3.9
	Industry	0.344	15.8	0.026	1.4	0.395	18.4	-0.094	-6.8
Firm Size	50-20 Employees	-0.160	-7.1	0.073	4.3	-0.223	-11.0	-0.006	-0.3
	20-5 Employees	-0.174	-8.1	0.009	1.1	-0.271	-14.6	-0.036	-2.4
	<5 Employees	-0.332	-18.3	0.088	7.9	-0.478	-33.2	-0.012	-1.2
Public Firm		-0.329	-9.8	-0.610	-21.9	-0.115	-5.0	-0.567	-25.7
Temporary Help Agency		0.573	21.7	0.141	14.1	0.366	15.4	0.164	9.1
Permanent Contract		-1.894	-32.1	0.015	0.7	-2.214	-13.3	0.095	4.5
Permanent Contract (intermittent)		0.942	21.9	-0.607	-13.4	0.692	7.1	-0.509	-14.3
Aggregate Variables									
Regional Unemployment. Rate (quarterly)		0.314	18.1	-0.075	-6.3	0.196	12.2	-0.217	-17.9
Growth Rate of the GDP (quarterly)		1.445	3.9	2.167	9.7	2.711	11.5	1.959	8.2
Baseline hazard (months)	Ln(t)	0.710	22.8	-0.199	-6.8	-0.559	-5.3	0.209	8.1
	Ln(t)^2	-3.899	-7.8	-0.032	-0.5	0.714	5.2	-0.768	-24.1
	Ln(t)^3	3.871	73.8	0.014	1.1	-0.425	-6.9	0.630	0.9
	Ln(t)^4	-1.459	-43.8	-	-	0.058	6.1	-0.219	-31.6
	Ln(t)^5	0.183	32.4	-	-	-	-	0.027	18.3
UI benefits covariates									
Permanent Contract*									
Remaining months before exhaustion of UI benefits	>4	-1.427	-21.4	-1.061	-30.3	-0.675	-16.6	-1.182	-33.3
	2-3	-0.982	-11.1	-0.870	-15.7	-0.700	-12.9	-0.927	-18.8
	1	0.484	3.7	-0.472	-6.5	1.117	18.5	-0.557	-8.3
Exhaustion Effect Months beyond the exhaustion of the UI	0	0.303	1.6	0.733	14.1	0.929	10.0	0.020	0.1
	1	0.865	6.6	0.288	4.3	1.025	8.0	0.154	2.0
	2-3	0.531	2.6	0.130	2.5	0.889	6.2	0.101	1.2
	4-5	0.299	1.5	0.003	1.2	0.618	4.5	-0.051	-2.0
Temporary Contract*									
Remaining months before exhaustion of UI benefits	>=4	-1.308	-31.6	-0.727	-29.9	-0.923	-30.6	-0.769	-30.4
	2-3	-1.250	-24.5	-0.645	-21.3	-0.991	-23.9	-0.632	-20.4
	1	-0.932	-14.3	-0.449	-11.6	-0.824	-15.1	-0.470	-12.7
Exhaustion Months beyond the exhaustion of the UI	0	-0.124	-2.0	0.219	6.5	-0.053	-1.6	0.080	1.6
	1	-0.118	-1.5	0.330	10.0	-0.106	-1.9	0.356	9.5
	2-3	-0.267	-3.5	0.246	8.5	-0.061	-1.5	0.245	6.5
	4-5	-0.278	-3.3	0.094	5.7	-0.181	-4.0	0.161	5.8
Potential UI benefits	Low	-0.029	-0.3	-0.032	-0.9	-0.177	-2.3	0.019	-0.1
	Medium	0.075	1.7	0.025	1.1	-0.164	-3.8	0.048	0.9
	High	0.221	5.6	0.079	3.8	0.103	1.3	0.182	6.6
Unemployment Assistance Benefits		-1.570	-40.2	-1.304	-44.9	-1.438	-14.4	-1.452	-14.1
Unobserved Heterogeneity	**Constant (Type I)**	-2.596	-28.2	-1.479	-23.5	-3.783	-19.3	-1.794	-35.3
	Type II	1.573	42.1	1.113	30.5	1.938	62.2	1.356	46.1
	Type III	-1.339	-50.8	-1.005	-58.4	1.133	63.9	0.435	57.4

Note A1: For female workers Pr(Type I)=57.4%; Pr(Type II)=20.3%; Pr(Type III)=22.3%; For male workers Pr(Type I)=47.9%; Pr(Type II)=29.7%; Pr(Type III)=22.3%

Note A2: The reference person for the unemployed: Full time native worker with a temporary contract of one month, low wage and job qualification with previous unemployment duration lengthier than 18 months, hired in a big private firm at the service sector.

Table A1: Results of the MMPH Model: Part 1: Employment Hazard Rate

		Men				Women			
		Layoff		Quit		Layoff		Quit	
		Coef.	t-s	Coef.	t-s	Coef.	t-s	Coef.	t-s
Individual Characteristics	Age (years/10)	0.429	39.5	0.304	17.5	0.337	15.0	0.093	1.2
	Experience (years/10)	-0.711	-52.1	-1.439	-52.7	-0.659	-18.4	-1.360	-16.6
	Immigrant	-0.683	-35.2	-0.168	-1.8	-0.499	-5.8	-0.023	0.5
Job Characteristics	Part-time	0.275	19.5	0.597	30.6	0.106	4.4	0.406	10.5
Job Qualification	High	-0.177	-15.2	-0.206	-10.7	-0.127	-5.3	-0.264	-6.3
	Medium	-0.632	-40.3	-0.692	-26.8	-0.458	-14.1	-0.701	-12.1
Sector of Activity	Construction	-0.229	-18.2	-0.287	-14.0	-0.402	-4.4	-0.498	-2.2
	Industry	-0.148	-9.2	-0.530	-21.5	0.060	3.8	-0.491	-5.5
Firm Size	50-20 Employees	-0.017	-0.9	0.108	4.4	0.042	-0.1	0.017	-0.3
	20-5 Employees	0.076	4.7	0.169	7.1	0.097	1.3	0.087	0.8
	<5 Employees	0.257	20.5	0.309	14.7	0.217	2.6	0.204	4.2
Public Firm		-0.362	-11.6	-1.178	-15.7	-0.302	-2.0	-1.124	-5.2
Permanent Contract		-2.944	-77.4	-1.194	-20.1	-3.104	-35.5	-1.050	-6.7
Permanent Contract (intermittent)		0.028	-0.2	-0.624	-6.8	-0.264	-1.2	-0.378	-3.5
Temporary Help Agency		0.224	10.6	-0.156	-4.8	0.082	1.6	-0.379	-2.2
Aggregate Variables	Regional Unemp. Rate (quarterly)	-0.006	1.6	-0.428	-19.7	-0.081	0.4	-0.547	-7.2
	GDP growth rate (quarterly)	-2.253	-9.0	-0.724	-0.6	-1.721	-2.0	-0.802	0.4
Baseline hazard (months)	Ln(t)	6.338	2.1	-1.194	-4.435	9.504	-1.1	3.149	14.6
	Ln(t)^2	-13.722	0.8	2.811	2.515	-23.341	2.2	-4.436	12.4
	Ln(t)^3	11.842	-2.5	-3.744	-0.619	21.643	-3.0	2.515	8.4
	Ln(t)^4	-4.865	3.8	2.024	0.055	-9.287	3.6	-0.619	5.9
	Ln(t)^5	0.954	-4.8	-0.484	3.151	1.869	-4.2	0.055	6.2
	Ln(t)^6	-0.072	5.5	-	-	-0.143	4.6	-	-
	T=3	0.552	15.6	-	-	0.825	7.7	-	-
	T=6	0.766	46.9	-	-	0.694	20.2	-	-
	T=12	1.028	47.0	-	-	1.120	13.4	-	-
	T=24	0.490	12.1	-	-	0.946	10.4	-	-
UIS covariates: Entitlement Effect*Permanent Contract	0	0.354	3.8	0.056	1.1	1.104	5.9	0.095	1.0
	1-4	0.344	6.2	0.250	5.6	0.314	0.2	-0.015	0.0
	5-8	0.467	8.4	0.206	4.4	0.360	1.7	-0.018	1.1
	9-12	0.389	6.6	0.249	4.8	0.438	0.7	-0.043	0.6
	13-16	0.367	6.2	0.246	4.7	0.457	1.7	-0.039	0.9
	>16	0.475	10.0	0.305	6.2	0.565	3.3	-0.036	0.1
Entitlement Effect*Temporary Contract	0	0.040	1.6	-0.122	-3.1	0.092	1.9	-0.215	-1.2
	1-4	-0.193	-10.7	-0.089	-3.0	-0.307	-7.2	-0.357	-2.6
	5-8	-0.238	-11.6	-0.168	-4.5	-0.328	-6.2	-0.409	-1.8
	9-12	-0.270	-12.2	-0.227	-5.4	-0.370	-6.8	-0.480	-3.3
	13-16	-0.342	-15.1	-0.253	-6.0	-0.430	-7.8	-0.527	-1.4
	>16	-0.465	-32.2	-0.130	-1.0	-0.612	-14.2	-0.523	-3.2
Potential UI benefits	Low	0.159	11.2	0.049	1.9	0.207	5.6	0.092	-0.7
	Medium	0.105	6.8	-0.125	-5.2	0.167	4.5	0.060	-0.6
	High	-0.046	-2.8	-0.253	-7.9	-0.045	-1.0	-0.048	-2.8
Unobserved Heterogeneity[35]	**Constant (Type I)**	-3.523	-71.0	-3.890	-44.4	-3.279	-29.9	-3.292	-16.1
	Type II	-0.892	-5.0	-0.899	-7.1	-0.742	-5.0	-0.710	-7.1
	Type III	0.830	19.5	0.978	12.4	0.844	19.5	1.005	12.4

Same as Note A1 and Note A2

[35]Notice that the constant parameter of the employment hazard rate for workers type II and type III will be the sum of the estimated constant term corresponding to type I worker's plus the estimated constant term for workers type II and type III, respectively.

Table A1: Results of the MMPH Model: Part 3: Voluntary Unemployment Hazard Rate

		Men		Women	
		Coef.	t-s	Coef.	t-s
Individual Characteristics	Age (years/10)	-0.087	-5.0	-0.121	-7.8
	Experience (years/10)	0.354	21.5	0.221	12.6
	Immigrant	0.270	14.3	0.204	9.1
Job Characteristics	Part-Time Job	-0.285	-19.0	-0.214	-16.0
Job Qualification	Medium	0.053	3.8	0.043	3.0
	High	-0.088	-3.7	-0.006	0.4
Sector of Activity	Construction	0.131	9.2	-0.082	-2.0
	Industry	0.074	3.5	-0.040	-0.7
Firm Size	50-20 Employees	0.000	-1.2	0.000	-1.2
	20-5 Employees	0.055	2.8	0.060	3.1
	<5 Employees	0.097	5.0	0.056	3.6
Public Firm		-0.564	2.0	-0.261	-5.1
Temporary Help Agency		0.065	1.4	0.157	4.5
Permanent Contract		0.030	3.0	0.052	3.1
Baseline hazard (months)	Ln(t)	-0.472	-9.7	-0.540	7.5
	Ln(t)^2	-0.175	-5.1	-0.114	-12.9
	Ln(t)^3	0.058	8.9	0.043	-15.8
Aggregate Variables					
Regional Unemployment Rate (quarterly)		0.023	1.4	-0.067	-3.5
Growth Rate of the GDP (quarterly)		3.347	8.6	3.058	7.3
Unobserved Heterogeneity	**Constant (Type I)**	-1.339	-15.4	-1.462	-1.5
	Type II	-0.077	-15.0	0.468	6.4
	Type III	-0.862	-14.0	-0.067	-12.3

Same as Note A1 and Note A2

Table A2: Model Specification Comparison (Part I: Employment Hazard Rate)

		Women				Men			
		LAYOFF		QUIT		LAYOFF		QUIT	
		MODEL I	MODEL II	MODEL I	MODEL II	MODEL I	MODEL II	MODEL I	MODEL II
Individual Characteristics	Age (years/10)	0.241**	0.374**	0.005	0.123	0.358**	0.518**	0.227**	0.378**
	Experience (years/10)	-0.441**	-0.729**	-1.161**	-1.393**	-0.548**	-0.846**	-1.278**	-1.526**
	Immigrant	-0.395**	-0.519**	0.098**	-0.026**	-0.583**	-0.781**	-0.039**	-0.230**
Job Characteristics	Part-time	0.100**	0.121**	0.401**	0.416**	0.259**	0.289**	0.577**	0.619**
Job Qualification	High	-0.101**	-0.126**	-0.231**	-0.256**	-0.157**	-0.189**	-0.177**	-0.205**
	Medium	-0.381**	-0.471**	-0.615**	-0.698**	-0.552**	-0.665**	-0.589**	-0.704**
Sector of Activity	Construction	-0.382**	-0.423**	-0.465**	-0.512**	-0.216**	-0.238**	-0.268**	-0.286**
	Industry	0.072**	0.063**	-0.482**	-0.484**	-0.122**	-0.167**	-0.505**	-0.534**
Firm Size	50-20 Employees	0.052**	0.049**	0.030	0.031	-0.015	-0.009	0.114**	0.108**
	20-5 Employees	0.107**	0.104**	0.099**	0.101**	0.067**	0.084**	0.163	0.166
	<5 Employees	0.209**	0.227**	0.199**	0.216**	0.237**	0.278**	0.284**	0.317**
Public Firm		-0.257**	-0.313**	-1.068**	-1.128**	-0.317**	-0.399**	-1.112**	-1.195**
Permanent Contract		-2.860**	-3.193**	-0.791**	-1.087**	-2.783**	-3.016**	-0.987**	-1.250**
Permanent Contract (intermittent)		0.080**	0.092**	-0.340**	-0.321**	-0.012	-0.029	-0.705**	-0.651
Temporary Help Agency		-0.177**	-0.258**	0.434**	-0.357**	0.217**	0.245**	-0.188**	-0.139
Aggregate Variables	Regional Unemp. Rate (quarterly)	-0.038**	-0.074**	-0.506**	-0.518**	0.018	-0.008	-0.414**	-0.410**
	GDP growth rate (quarterly)	-1.464**	-1.711**	-0.561	-0.654	-1.787**	-2.126**	-0.202*	-0.557
Baseline hazard (months)	Ln(t)	9.411**	9.525**	2.889**	3.058**	6.271**	6.368**	2.664**	2.802**
	Ln(t)^2	-23.24**	-23.25**	-4.091**	-4.083**	-13.70**	-13.71**	-3.636**	-3.615**
	Ln(t)^3	21.570*	21.532**	2.228**	2.240**	11.825*	11.808**	1.938**	1.956**
	Ln(t)^4	-9.291**	-9.220**	-0.527**	-0.537**	-4.868**	-4.828**	-0.458**	-0.471**
	Ln(t)^5	1.879**	1.852**	0.045**	0.046**	0.957**	0.941**	0.039**	0.041**
	Ln(t)^6	-0.144**	-0.141**	-	-	-0.072**	-0.071**	-	-
	T=3	0.821**	0.834**	-	-	0.556**	0.559**	-	-
	T=6	0.706**	0.702**	-	-	0.769**	0.767**	-	-
	T=12	1.105**	1.128**	-	-	1.018**	1.031**	-	-
	T=24	0.943**	0.935**	-	-	0.492**	0.493**	-	-
UIS covariates: Entitlement Effect*Permanent Contract	0	1.100**	1.106**	0.131	0.105	0.387**	0.325**	0.103	0.018
	1-4	0.287**	0.330**	0.036	0.002	0.363**	0.337**	0.294**	0.230**
	5-8	0.325**	0.374**	0.029	0.002	0.480**	0.457**	0.244**	0.190**
	9-12	0.389**	0.452**	-0.005	-0.023	0.391**	0.381**	0.280**	0.237**
	13-16	0.391**	0.478**	-0.022	-0.019	0.353**	0.365**	0.260**	0.239**
	>16	0.436**	0.602**	-0.080	-0.018	0.390**	0.492**	0.251**	0.310**
Entitlement Effect*Temporary Contract	0	0.098**	0.105**	-0.275**	-0.207**	0.038**	0.046**	-0.169**	-0.132**
	1-4	-0.294**	-0.292**	-0.345**	-0.346**	-0.197**	-0.189	-0.101**	-0.098**
	5-8	-0.310**	-0.312**	-0.390**	-0.395**	-0.240**	-0.237**	-0.176**	-0.180**
	9-12	-0.353**	-0.357**	-0.463**	-0.471**	-0.275**	-0.271**	-0.234**	-0.252**
	13-16	-0.417**	-0.414**	-0.508**	-0.517**	-0.352**	-0.342**	-0.264**	-0.284**
	>16	-0.640**	-0.582**	-0.516**	-0.513**	-0.522**	-0.457**	-0.171**	-0.178**
Potential UI benefits	Low	0.198**	0.202**	0.072**	0.094**	0.164**	0.159**	0.044*	0.068**
	Medium	0.155**	0.161**	0.044	0.061	0.104**	0.105**	-0.134*	-0.116**
	High	-0.060**	-0.051**	-0.054	-0.050	-0.050**	-0.030*	-0.252**	-0.250**
	Constant (Type I)	-3.154**	-3.255**	-3.153**	-3.366**	-3.459**	-3.536**	-3.774**	-4.207**
Unobserved Heterogeneity	**Type II**	-	-1.216**	-	-0.803**	-	-1.098**	-	-0.501**
	Type III	-	1.106**	-	1.375**	-	0.844**	-	1.371**

Note A3: Model I: Duration Model without controlling for unobserved heterogeneity; Model II: Duration Model controlling for unobserved heterogeneity (three support points) but assuming independence between labour market states;

Table A2: Model Specification Comparison (Part II: Involuntary Unemployment Hazard Rate)

		Women				Men			
		RECALL		NEW JOB		RECALL		NEW JOB	
		MODEL I	MODEL II	MODEL I	MODEL II	MODEL I	MODEL II	MODEL I	MODEL II
Individual Characteristics	Age (years/10)	0.181**	0.164**	-0.204**	-0.194**	0.080**	0.065**	-0.098**	-0.092**
	Experience (years/10)	0.083**	0.145**	0.053**	0.094**	0.156**	0.259**	0.103**	0.171**
	Immigrant	-0.248**	-0.210**	0.141**	0.125**	0.077**	0.184**	0.160**	0.196**
Job Characteristics	Part-Time Job	0.035**	-0.016	-0.150**	-0.165**	0.002	-0.131**	-0.308**	-0.373**
Job Qualification	Medium	-0.066**	-0.041**	0.125**	0.140**	0.028*	0.064**	0.055**	0.079**
	High	0.157**	0.178**	0.081**	0.124**	0.064**	0.055**	-0.018	-0.004
Sector of Activity	Construction	-0.378**	-0.412**	-0.065**	-0.119**	0.307**	0.401**	0.111**	0.198**
	Industry	0.393**	0.356**	-0.138**	-0.107**	0.341**	0.336**	-0.021*	0.020
Firm Size	50-20 Employees	-0.178**	-0.223*	0.034**	-0.006	-0.159**	-0.169**	0.094**	0.070**
	20-5 Employees	-0.229**	-0.271	0.011**	-0.035*	-0.153**	-0.171**	0.046**	0.015**
	<5 Employees	-0.410**	-0.476**	0.057**	-0.013	-0.329**	-0.323**	0.142**	0.094**
Public Firm		0.008	-0.128**	-0.527**	-0.588**	-0.140**	-0.329**	-0.465**	-0.606**
Temporary Help Agency		0.264**	0.361**	0.090**	0.175**	0.465**	0.573**	0.009	0.143**
Permanent Contract		-2.079**	-2.204**	0.242**	0.079**	-1.890**	-1.872**	0.183**	0.018
Permanent Contract (intermittent)		2.874**	0.750**	-0.619**	-0.496**	0.965**	0.922**	-0.723**	-0.623**
Regional Unemployment. Rate (quarterly)		0.224**	0.189**	-0.232**	-0.237**	0.328**	0.304**	-0.104**	-0.076**
Growth Rate of the GDP (quarterly)		2.645**	3.177**	1.516**	1.897**	1.016**	1.239**	2.185**	2.131**
Baseline hazard (months)	Ln(t)	-0.715**	-0.357*	0.176**	0.301**	0.347*	0.829**	-0.254**	-0.176*
	Ln(t)^2	0.623**	0.572**	-0.846**	-0.791**	-3.745**	-4.025**	-0.090**	-0.011*
	Ln(t)^3	-0.400**	-0.389**	0.638**	0.608	3.770**	3.919**	0.020**	0.005**
	Ln(t)^4	0.058**	0.056**	-0.213**	-0.205**	-1.428**	-1.458**	-	-
	Ln(t)^5	-	-	0.026**	0.025**	0.179**	0.180**	-	-
UI benefits covariates									
Permanent Contract*									
Remaining months before exhaustion of UI benefits	>4	-0.390**	-0.713**	-0.970**	-1.204**	-0.885**	-1.438**	-0.763**	-1.056**
	2-3	-0.306**	-0.643**	-0.757**	-0.936**	-0.489**	-1.034**	-0.646**	-0.879**
	1	1.170**	1.095**	-0.490**	-0.575**	0.756**	0.386**	-0.294**	-0.466**
Exhaustion Effect Months beyond the exhaustion of the UI	0	0.849**	0.876**	0.108*	0.004	0.437**	0.239*	0.885**	0.750**
	1	0.870	0.968**	0.211*	0.126*	1.168**	1.066**	0.380**	0.314**
	2-3	0.735	0.826**	0.125*	0.067	0.560**	0.553**	0.217**	0.168*
	4-5	0.515**	0.558**	-0.095*	-0.086*	0.363	0.324	0.012	0.062
Temporary Contract*									
Remaining months before exhaustion of UI benefits	>=4	-0.529**	-0.920**	-0.480**	-0.781*	-0.831*	-1.299**	-0.346**	-0.716**
	2-3	-0.716**	-0.979**	-0.394**	-0.642**	-0.886**	-1.250**	-0.335**	-0.637**
	1	-0.499**	-0.813**	-0.234**	-0.481**	-0.555**	-0.932**	-0.148**	-0.444**
Exhaustion Months beyond the exhaustion of the UI	0	0.155**	-0.029	0.227**	0.071**	0.051	-0.120**	0.418**	0.228**
	1	0.012**	-0.106*	0.470**	0.332**	0.028	-0.100	0.523**	0.353**
	2-3	0.000**	-0.078	0.320**	0.213**	-0.131**	-0.236**	0.430**	0.286**
	4-5	-0.162**	-0.195**	0.193**	0.131**	-0.163**	-0.219**	0.229**	0.156**
Unemployment Assistance Benefits		-1.032**	-1.434**	-1.172**	-1.486**	-1.097**	-1.584**	-0.966**	-1.315**
Potential UI benefits	Low	-0.180**	-0.210	0.033**	-0.003	0.018**	-0.012	-0.008	-0.024
	Medium	-0.159**	-0.182**	0.067**	0.025*	0.129**	0.079*	0.051*	0.028
	High	0.109**	0.087**	0.191**	0.170**	0.292**	0.234**	0.118**	0.088**
Unobserved Heterogeneity	**Constant (Type I)**	-3.046**	-3.847**	-1.321**	-1.930**	-2.654**	-2.265**	-1.632**	-1.288**
	Type II	-	2.939**	-	2.403**	-	1.689**	-	1.261**
	Type III	-	1.279**	-	1.034**	-	-1.405**	-	-1.048**

Same as Note A3

Table A2: Model Specification Comparison (Part III: Voluntary Unemployment Hazard Rate)

		Voluntary Unemployment			
		Women		Men	
		MODEL I	MODEL II	MODEL I	MODEL II
Individual Characteristics	Age (years/10)	-0.119**	-0.131**	-0.083**	-0.073**
	Experience (years/10)	0.204**	0.280**	0.285**	0.413**
	Immigrant	0.203**	0.253**	0.245**	0.311**
Job Characteristics	Part-Time Job	-0.208**	-0.273**	-0.264**	-0.356**
Job Qualification	Medium	0.041**	0.055**	0.048**	0.062**
	High	-0.013	0.010	-0.091**	-0.082**
Sector of Activity	Construction	-0.087*	-0.114**	0.111**	0.180**
	Industry	-0.039	-0.023**	0.053**	0.083**
	20-5 Employees	0.057**	0.074**	0.054	0.059
Firm Size	<5 Employees	0.055**	0.066**	0.096**	0.086*
Public Firm		-0.253**	-0.337**	-0.486**	-0.682**
Temporary Help Agency		0.147**	0.185**	0.031	0.075*
Permanent Contract		0.049**	0.053**	0.014*	0.051*
Baseline hazard (months)	Ln(t)	-0.558**	-0.358**	-0.527**	-0.374**
	Ln(t)^2	-0.126**	-0.188**	-0.179**	-0.182**
	Ln(t)^3	0.046**	0.070**	0.054**	0.075**
Aggregate Variables					
Regional Unemployment Rate (quarterly)		-0.071**	-0.087**	0.017**	0.029
Growth Rate of the GDP (quarterly)		2.833**	2.873**	0.309**	2.978**
Unobserved Heterogeneity	**Constant (Type I)**	-1.273**	-0.340**	0.068**	-1.234**
	Type II	-	-0.967**	-	-2.454**
	Type III	-	-2.213**	-	-1.038**

Same as Note A3